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ADENOCARCINOMA OF THE BREAST IN A SOUTH AFRICAN BANTU BOY AGED FOURTEEN

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Primary adenocarcinoma of the breast is extremely rare in boys. Only 4 well-authenticated cases of a younger age than the present case have been traced; the ages were 12,[1] 13,[2] 6,[3] and 12 years,[4] respectively. In addition, a case has been reported in a boy aged 14 years and 8 months.[5] The present case is believed to be the first reported in a South African Bantu boy.

CASE REPORT

The patient was referred from Potgietersrust to the Groothoek Mission Hospital in the Northern Transvaal on 5 May 1958, where he came under the supervision of Dr. G. C. C. Burger. The provisional diagnosis on admission was pulmonary tuberculosis with an effusion at the base of the left lung. The patient was not able to give his exact age, but this was independently estimated to be 14 years by at least 3 practitioners at the hospital experienced in African practice. He was pubertal.

On examination, a moderate degree of bilateral gynaecomastia was found. In addition, a small freely mobile hard mass was palpated in the right breast. The presence of a small pleural effusion at the base of the left lung was confirmed, but there was no further support for the diagnosis of pulmonary tuberculosis. The liver was palpated 2 fingers below the right costal margin. There was evidence of loss of weight, pallor and haematuria. Bilharzia was diagnosed by rectal biopsy. No other significant physical signs were elicited.

An excision biopsy of the right breast was performed in June 1958.

During the 2 months following admission the pleural effusion extended to involve the whole of the left pleural cavity. The liver, the surface of which felt smooth, enlarged further, and became palpable at 4 fingers' breadth below the right costal margin. The haematuria soon disappeared and did not recur.

The patient died on 14 July 1958. Permission for autopsy was refused.

Report on Excision Biopsy

Macroscopic. A smooth, well defined, oval, white, hard mass measuring 2·5 cm. in its greatest diameter (Fig. 1), was received for

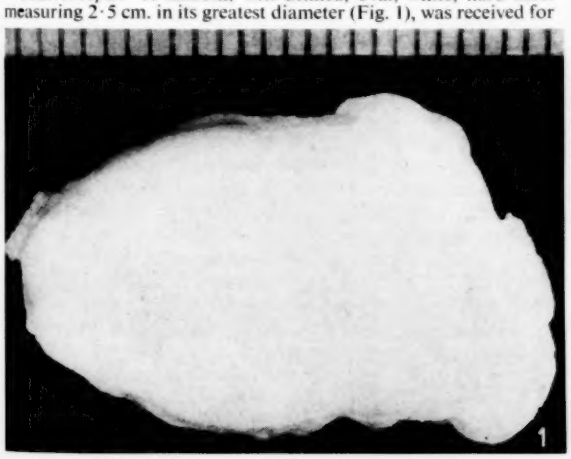

Fig. 1. Macroscopic view of cut surface of tumour. Scale in mm.

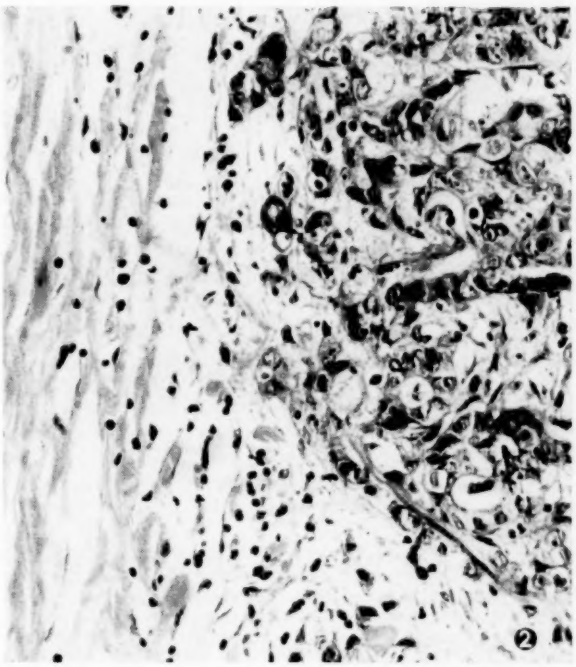

Fig. 2. View through tumour showing relationship to surrounding tissue. (× 240).

Fig. 3. View through edge of tumour showing dilated mammary ducts. (× 120).

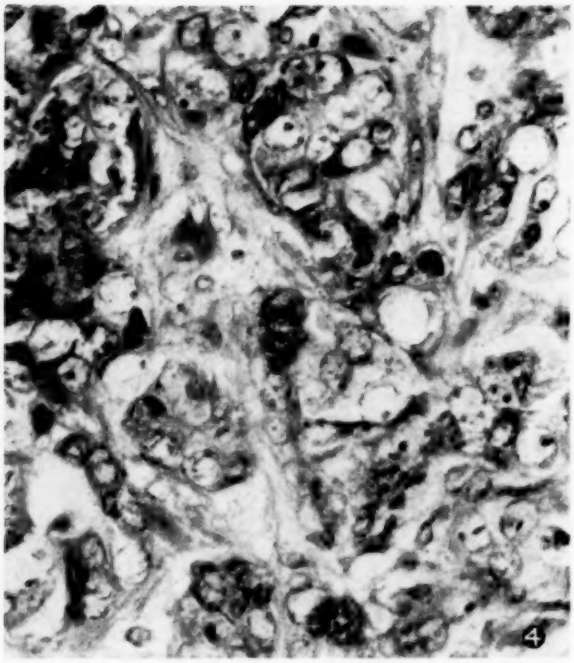

Fig. 4. High power (× 480) through centre of neoplasm showing mitotic figures and large vacuolated cells with prominent nuclei and nucleoli.

examination by the South African Institute for Medical Research, Johannesburg. The specimen felt hard and gritty on being cut with a knife. The cut surface was white and fibrous, with faint yellowish streaks.

Histology. Microscopic section (Fig. 2) showed a poorly differentiated epithelial neoplasm, surrounded by a rim of fibro-fatty tissue in which dilated ducts were present. The cells of the tumour were arranged in cords and contained numerous mitotic figures (Fig. 4). Many of the cells contained clear vacuoles and large deeply-staining nuclei with prominent nucleoli. Lumina were observed and there was a marked fibrous tissue reaction of the stroma in places. There was a minimal amount of adipose tissue present. Dilated mammary ducts with hyperplasia of the duct epithelium and surrounding stroma were seen at the edges of the tumour (Fig. 3). The histological features were those of a poorly differentiated adenocarcinoma in a breast which was the seat of a moderate degree of gynaecomastia.

DISCUSSION

1. *Oestrogens and Breast Cancer*

Oestrogen excess has been implicated as an aetiological factor in breast cancer. Experimental work by Loeb,[6] Murray[7] and Lacassagne[8] has shown a relationship between oestrogen excess and cancer of the breast in mice.

Goodall[9] states that there are 7 well-documented cases of primary cancer of the male breast in human patients following stilboestrol therapy. This has been questioned by Moulton[10] in his report of a case of mammary neoplasia in a male receiving oestrogen therapy for carcinoma of the prostate. He believes that such cases are much more likely to be metastatic from the prostate than primary breast cancer.

2. *Oestrogens, Gynaecomastia and Carcinoma of the Breast in Africans*

Oestrogen excess in males is an undisputed factor in the aetiology of gynaecomastia. The African male is reported to excrete more oestrogens than White South Africans (Bersohn and Oelofse,[11] Blumberg *et al.*[12]). Of a series of autopsied Johannesburg African males 34% were found to have some degree of gynaecomastia.[13]

In a series of Johannesburg Africans, Higginson and Oettle[13] found 2 cases of breast cancer in males and 49 in females; the incidence of African male breast cancer was not significantly different from that expected, when compared with corresponding figures for the USA.

On the basis of these data, therefore, admittedly based on relatively few cases drawn from a restricted area, there appears to be no correlation between the incidence of male breast cancer and gynaecomastia. This is in accordance with the view of Foot and Stewart[14] and Moore *et al.*[15]

3. *Sex and Age*

Somerville,[16] in his own series of 19 cases of male breast cancer, found the average age of presentation to be 55·2 years.

Breast cancer has been reported[17-21] in girls of 12, 11, 11, 10 and 10 years of age, making a total of 5 cases under the age of 15 years. In male children in the same age group, a total of 6 cases (including the present one) have now been reported.

From these data it appears that there is no significant sex difference in the incidence of primary breast cancer among children. Most of the affected children were either pubertal or approaching puberty.

It should be noted that despite the rarity of carcinoma of the breast, gynaecomastia is common in pubertal boys.[22]

SUMMARY

1. A case is reported of breast adenocarcinoma in a South African Bantu boy suffering from gynaecomastia.

2. The relative incidence of cancer of the breast in male and female African Bantu and various White populations is reviewed.

3. Although oestrogens are known to cause gynaecomastia and have been implicated in the aetiology of breast carcinoma, a consideration of the literature lead to the conclusion that in the present case the gynaecomastia and carcinoma were not causally related.

My thanks are due to Drs. G. C. C. Burger and J. N. du Plessis of the Groothoek Mission Hospital, who provided the clinical details of this case, and to Dr. E. H. Cluver, Director of the South African Institute for Medical Research, for facilities granted.

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EDITORIAL : VAN DIE REDAKSIE

EXPOSURE TO ACTINIC RAYS

A heroine from the pages of Jane Austen would normally have been given a complexion that was basically milky in colour. Perhaps she might, on occasion, have been allowed colours of sufficient depth to remind the beholder of peaches and cream. Any appreciable redness in the cheeks would have brought the flush of tubercle to the mind of the ever alert village medico and at the same time suggested, in all probability, rouge and immorality to the ladies of the vicarage. None of these keen observers would, however, have felt that pallor was anything other than interesting. To couple it with ill-health or ghosts would not have occurred to them. Indeed, ladies wore poke bonnets of voortrekker type and made additionally certain of staving off the sun's rays by carrying a parasol as well.

In our age it is said that all handsome men are slightly sun-tanned and a bronzed skin is automatically linked with robust health. Apart from irradiating our ergosterol, which very few of us in this country need, the danger of prolonged and repeated exposure to actinic rays probably handsomely outweigh the apparent advantages. However, a glimpse at any of our beaches at once demonstrates that any advice to avoid the sun will be totally disregarded by the majority. The bonnet and parasol have been replaced by sun glasses which, by providing a disguise, may thus help to bolster our little egos, but which protect the eyes alone and afford no cover whatsoever for the rest of our faces.

To those possessing Nordic colouring particularly, i.e. blue eyes and fair hair, the chances of developing a rodent ulcer in sunny countries are quite high; whilst those with Mediterranean complexions are probably reasonably safe. Heliophiles who firmly reject all hats and such-like shields can still partly save themselves by the frequent and liberal application of protective sun-screening lotions or salves. There is little to be gained from rubbing these into the back; the part that really needs them may be defined as all skin above the mouth, but including the lips.

Many, of course, have already developed a little rough patch which never quite heals. This sometimes leaves a little ulcer and occasionally is no more than a little heaped-up epithelium or a tiny cyst with a leash of vessels. This is the stage at which to trap the rodent and complete cure can be safely promised. The methods employed are two: either the plastic surgeon with his healing knife can cut it out or the radiotherapist with his ray can obliterate it. Both, however, must remember that the rodent is like the iceberg; there is more below than shows on the surface.

So the surgeon must excise widely enough to effect total removal; and the field the therapist uses must also be big enough to ensure no recurrence—this means treating roughly an area the size of a shilling to destroy a lesion smaller than a tickey. If X-ray therapy is applied in suitable daily doses for 10 treatments little or no scarring will result. The patient should, however, be warned to expect, first reddening and itching, followed by wet desquamation and scab formation. After an interval of 6 - 8 weeks the scab will separate and healthy, healed skin will be revealed and the patient should be for ever grateful.

Certainly, if the patient had ever seen a long-standing untreated rodent ulcer, he would at least appreciate the apt choice of name. A face which has been so extensively destroyed as to have lost most of the soft tissue of one half and which reveals an orbit, empty of eye, with dura mater glistening through the partly destroyed orbital roof, does indeed look as though the rats have been at it. Today such a sight should only be found staring grimly out of a glass jar in a pathological museum. If the ease with which these ulcers can now be treated is fully appreciated, there need never again be a patient so afflicted, with or without a parasol and bonnet.

HULP AAN DRANKSUGTIGE PERSONE

Die eerste jaarverslag van die eerste Provinsiale hospitaal vir dranksugtiges wat in die land opgerig is, is onlangs in die *Tydskrif* gepubliseer.[1] Die verslag moet om verskeie redes as 'n baie belangrike dokument beskou word. Daar is byvoorbeeld die verwysing na die resultate wat met die behandeling bereik is en ook 'n volledige beskrywing van die beginsels waarop die hospitaal gedryf word en die metodes van benadering van die probleem. Ook het hierdie verslag interessante implikasies vir die behandeling van ander soorte pasiënte, byvoorbeeld pasiënte wat ly aan ligte neurotiese toestande of geestesversteurings.

Die probleem van dranksugtiges is alreeds by 'n vorige geleentheid[2] behandel. Die implikasies van die verslag waarna ons so pas verwys het, is egter so belangrik dat 'n heroorweging van die probleem geregverdig is.

Dit is bekend dat dranksugtigheid 'n wydverspreide probleem met baie vertakkinge is. Dit behels nie net die persoon self nie, maar ook sy gesin, sy werkgewer en die samelewing as geheel. As die probleem van dranksugtigheid dus sonder beheer voortgaan, kan onberekenbare skade in terme van menslike gesondheid en geluk en ook in terme van ekonomiese produktiwiteit berokken word.

Tot redelik onlangs was daar nog altyd 'n baie sterk vooroordeel teen dranksugtiges. En alhoewel die probleem baie gekompliseerd is en die resultate in individuele gevalle soms ontmoedigend is, ly dit tog geen twyfel nie dat 'n positiewe diens aan die dranksugtige, en dus ook aan die samelewing, wel gelewer kan word.

In Suid-Afrika word daar op verskillende sentrums uitstekende werk gedoen in verband met die behandeling en rehabilitasie van dranksugtiges. Die probleem van dranksugtigheid is egter so groot dat dit waarskynlik op die beste manier aangepak kan word met die behulp van goed-opgeleide personeel teen die agtergrond van 'n staatsondersteunde inrigting. Daarom is die eksperiment van die Parkweg-Hospitaal wat deur die Kaapse Provinsiale Administrasie uitgerus is en gedryf word, belangrik.

Soos dr. Walton in die jaarverslag aantoon[1] bestaan die

span wat die belangrike werk onderneem uit die mediese personeel, sowel as uit verplegings-personeel, maatskaplike werkers, en beroepsterapeute—almal persone wat 'n intensiewe kursus van opleiding vir hierdie soort werk ondergaan het en nog ondergaan. Dit is dus moontlik om gekonsentreerde aandag aan baie meer pasiënte te gee as waarvoor daar plek in die hospitaal is. Dit is eintlik beter om na die hospitaal te verwys as 'n spesiale kliniek, want daar is maar net 'n beperkte aantal beddens (dertig) en pasiënte word slegs vir kort periodes toegelaat. Sowel die pasiënte wat toegelaat word tot die inrigting as buitepasiënte wat die inrigting net vir behandeling sonder toelating besoek, kry die voordeel van die gesamentlike ervaring van die hele span wat die behandeling onderneem. Die behandeling sluit onder andere in (behalwe natuurlik die behandeling van die dranksugtigheid self) bykomstige fisiese siektes en gebreke wat die pasiënte mag hê en leiding en hulp ten opsigte van heraanpassing later, insluitende heraanpassing wat betref werkgeleenthede en maatskaplike verhoudings.

Die psigiatriese personeel wat gedurende die afgelope jaar met die probleem te doen gehad het en ook die betrokke outoriteite van die Provinsiale Administrasie self is só gunstig beïndruk deur die positiewe resultate wat wel bereik is dat dit in beginsel besluit is om 'n tweede dergelike hospitaal in Port Elizabeth op te rig. Die personeel wat die behandeling daar sal onderneem sal waarskynlik eers na die Parkweg-hospitaal kom om in staat te wees om van die ondervinding te kan gebruik maak wat in hierdie hospitaal opgedoen is.

Ons wil die hoop uitspreek dat die Kaapse Provinsiale Administrasie sowel as die Administrasies van die ander drie Provinsies hulle weg sal oopsien om die dienste wat op hierdie gebied gelewer word uit te brei. Die dranksugtiges is nie net mense met heel besondere probleme nie, maar 'n groot aantal van hulle is ook mense wat werklik gehelp wil word en wat ook gehelp kan word.

Ten slotte wil ons net weer daarop wys dat die terapeutiese ervaring by hierdie betreklik klein hospitaaltjie belangrike implikasies het. Dit is nie meer nodig om mense wat aanpassingsprobleme of geestesversteurings het in baie groot en duur inrigtings te versorg nie. Kleinere aktiewe eenhede, soos ons nou ook in die geval van die hospitaal vir dranksugtiges gesien het, kan wel 'n groot en positiewe bydrae lewer. Ons moet dus ook dink aan die oprigting van derglike behandelingseenhede vir die groot aantal pasiënte wat aan neurotiese moeilikhede ly en wat heel dikwels nog in hierdie land geen bevredigende heenkome het nie.

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ACUTE HAEMATOGENOUS OSTEOMYELITIS: A REVIEW OF 300 CASES TREATED DURING 1952-1959*

BARRY SHANDLING, F.R.C.S., *Surgeon, Red Cross War Memorial Children's Hospital, Cape Town*

Before the introduction of penicillin, of every 100 children afflicted with osteomyelitis 25 died and 50 more were seriously crippled for life. Although the condition has now lost its lethal implications, it remains a potent cause of serious disease, especially in children.

In 7 years 300 patients were treated at Groote Schuur Hospital and the Red Cross War Memorial Children's Hospital, Cape Town, and judging from other published series this appears to represent the highest incidence of osteomyelitis in the world. With an average stay in hospital of 44·5 days at a cost, in Cape Town, of £6 a day, this disease has cost the taxpayer over £80,000 in 7 years. So relatively

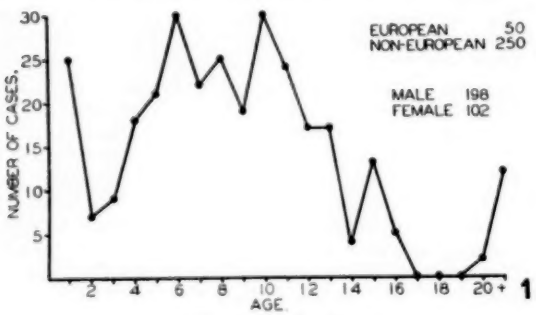

Fig. 1. Age incidence.

* Paper presented at the 42nd South African Medical Congress (M.A.S.A.), East London, C.P., September - October 1959.

frequent is the condition in Cape Town that we have a special 'osteitis ward' at the Children's Hospital.

The disease occurs mainly in children, and the plotted age incidence show peaks at 6 and 10 years of age, declining rapidly in the teens but with a high incidence in infants (Fig. 1). Male cases predominate over the female in the proportion of 2 : 1 and this is usually attributed to the greater activity and adventurousness and the consequent increased liability to trauma on the part of boys as compared to girls. In this series most of our patients were Coloured with a small sprinkling of Bantu. In America, however, it has been noted that the disease is less frequent in Negro children than White.

It has long been observed that osteomyelitis is a disease of the poor[1]—Stevenson[2] pointed out that it was rarely seen in private practice in Glasgow—and this is borne out in Cape Town, where orthopaedic and general surgeons in private practice see very few cases.

It is of interest that osteomyelitis is unknown in the lower animals.[2]

In the present series the disease was seen in greatest numbers in September, with January and March next in frequency (Fig. 2). It is convenient that there are not many cases in the winter because in that season we admit a large number of burns, and both conditions require skilled and attentive nursing.

Causation

The aetiology of osteomyelitis remains obscure, notwithstanding much work that has been done on the blood supply

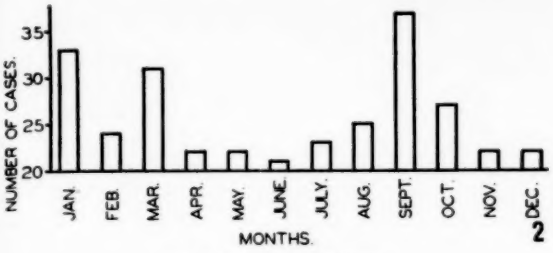

Fig. 2. Seasonal incidence.

of long bones and the reasons for the site of election in the metaphysis.

In 1922 Starr[3] emphasized the metaphyseal origin of the overwhelming majority of cases of haematogenous osteomyelitis. In 1929 Harris[4] alleged, on experimental grounds, that the vessels of the diaphysis are in effect end-arteries and that the phenomena of the disease in the metaphysis are essentially infarctive. The usual reason given for infection at the end of a long bone is that the greater vascularity is responsible for vascular stasis. It has also been shown, however, that there is poor phagocytosis at the end of a long bone.[5] Lewin and Schuman[6] indicate potential anastomoses between epiphyseal, metaphyseal and diaphyseal vessels.

Trauma has been incriminated in the aetiology. In the present series (Table I) a history of trauma was obtained in 37·6% of cases, care being taken to include only those cases where the trauma, judging by the case notes, was significant. This figure of 37·6% is in accordance with the findings of other writers.

If trauma is in fact important in aetiology, it might be expected to be just as likely to cause subperiosteal damage and infection as metaphyseal. A blow to the periosteum would

TABLE I

	No. of cases	*Percentage*
History of trauma	119	37·6
Preceding lesion	46	15·3
Significant regional lymphadenopathy	108	36

destroy tissue and release histamine, which in turn acting as a dilator of the vessels would retard circulation and allow bacteria to be deposited in the affected area. Farr[7] belittled the role of trauma, pointing out that in no case has osteomyelitis followed a simple fracture of the bone.

Preceding lesion (Table I). The pathogenesis of the disease presupposes a bacteraemia or septicaemia arising elsewhere in the body, and in this series, evidence that was in any way tenuous being ignored, 15·3% of the patients had some preceding septic lesion. I have not estimated the corresponding percentage in our population at large, but should not be greatly surprised if it approximated the same figure.

Lymphadenopathy (Table I). In this series, 36% of cases showed significantly enlarged palpable and tender regional lymph nodes. Enlarged lymph nodes have never been featured in the clinical picture of acute osteomyelitis in other series. In some of our cases, however, they may have been secondary to another infected focus in the same limb.

The *erythrocyte sedimentation rate* (ESR) is an important, indeed essential, investigation in the treatment of acute osteomyelitis. The initial readings in the cases in this series are reflected in Fig. 3. Neither the initial reading nor the

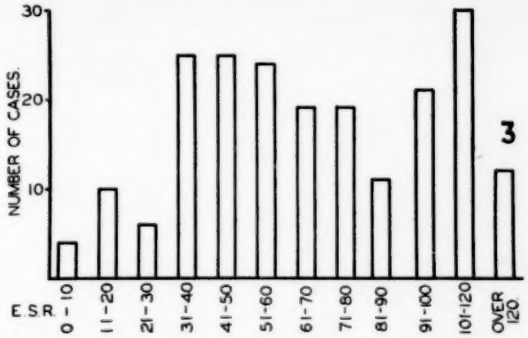

Fig. 3. Erythrocyte sedimentation rates: initial readings (mm. in the first hour—Westergren).

time taken for the ESR to return to normal seems to be of any prognostic import. However, the ESR is the investigation *par excellence* which we use to guide us in treatment. The average case took 52·5 days to reach an ESR of 20 mm. or less (first hour—Westergren).

The Organism

It is generally accepted that osteomyelitis is but one complicating aspect of a septicaemia which should reveal the causative organism on blood culture. Not all our cases had this done or recorded, but of 180 blood cultures 102 (56·6%) were positive and the remainder negative. The incidence of contaminants in the cultures was exceedingly small—the result of meticulous asepsis in procuring the specimens.

Table II shows the organisms isolated either from the blood or the pus, and their sensitivity to antibiotics. It will be noted that in 174 cases (96%) the organism was *Staphylococcus aureus*. Recently more and more papers have been appearing on the problem of infection in hospital and the increasing frequency of staphylococcal complications, particularly

TABLE II. ORGANISM AND SENSITIVITY

Organism	*Sensitivity*	*No. of Cases*	*Per-centage*
Staphylococcus aureus	All the antibiotics	146	81·1
,,	All except penicillin	17	9·4
,,	All except penicillin and sulphatriad	4	2·2
,,	Chloromycetin and erythromycin only	7	3·9
Streptococcus viridans	All the antibiotics	1	
,,	All except sulphatriad	1	
Beta-haemolytic streptococcus	All the antibiotics	3	
Klebsiella aerogenes	All except penicillin	1	
Proteus	Chloromycetin and streptomycin only	1	

infection with staphylococci insenstitive to penicillin. It comes as a refreshing surprise, therefore, to discover that the overwhelming majority of our cases were caused by a staphylococcus aureus sensitive to the by now almost archaic penicillin. Many of our cases, unfortunately, come to us late, often not before someone has tried a 'shot' of penicillin. The possible result of such misguided and inadequate therapy is twofold: First it may sterilize the blood (and hence the blood culture) but not the metaphyseal abscess; and secondly the infecting organism may develop insensitivity to penicillin.

Of the 17 cases in which the staphylococcus was sensitive to all the antibiotics tested at the time (and this varied from year to year) except penicillin, the majority had received one or more injections of penicillin before admission.

The staphylococcus sensitive to chloromycetin and erythromycin only is our local resident hospital organism—it was isolated in 7 cases.

We have been fortunate in our series in having had only 2 cases in which a streptococcus viridans was the organism responsible.

Bones Involved

Many bones were involved, and the maximum incidence, in this series as in others, was at the upper ends of the tibiae and the lower ends of the femora. Next in frequency were the lower ends of the tibiae and the upper ends of the femora (Fig. 4). There were 22 cases of osteomyelitis of the neck of the femur.

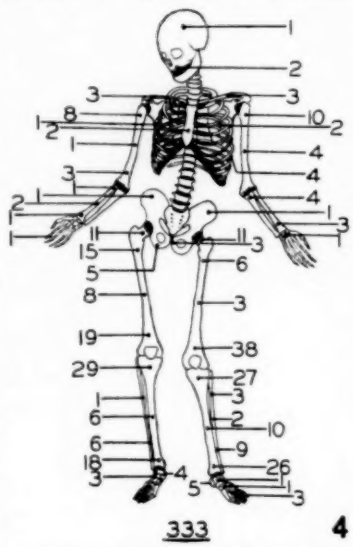

Fig. 4. Frequency of cases in the different bones of the body.

Clinical Picture

The clinical picture of acute haematogenous osteomyelitis is well known and hardly needs to be dwelt upon. The toxic-looking child, often desperately ill, with a limb immobile, hot; tender and swollen—all these are the classic signs of acute osteomyelitis, familiar to everyone.

I should, however, like briefly to mention the condition of osteomyelitis of the neck of the femur—a site of the disease which has been responsible for many misdiagnoses and often disastrous results. We frequently have these cases in children who have initially been labelled poliomyelitis, irritable hip, arthritis of the hip, rheumatic fever, even typhoid, pyrexia of unknown origin, etc. The condition is difficult to diagnose, especially where general signs predominate and local signs are minimal. Failure to be aware of the condition leads to delay in diagnosis and treatment, and life-long crippling aftermaths.

TREATMENT

Much has been written on the treatment of acute osteomyelitis, especially since the advent of penicillin. Agerholm *et al.*,[8] Trueta *et al.*,[9] and Tucker *et al.*[10] have held that penicillin treatment has not eliminated the need for extensive emergency surgery. Altmeier *et al.*,[11] Kenney,[12] Hudson,[13] and others, on the other hand, maintain that emergency surgery is usually unnecessary in cases treated adequately with penicillin. Higgins *et al.*[14] aspirate the subperiosteal abscess and exhibit antibiotics.

The treatment of acute haematogenous osteomyelitis in these two hospitals is carried out traditionally by the general surgical staff. Our policy is based on the view that surgical decompression and drainage of the metaphysis are essential, the objects being (1) to evacuate pus, (2) to prevent sequestration by relief of tension, (3) to limit the amount of bone involved, and (4) to improve the blood supply and thereby the effectiveness of antibiotic therapy.

Tucker and Hollenberg[10] have confirmed what Agerholm and Trueta[8] had shown, viz. that massive doses of antibiotics cannot sterilize the metaphyseal abscesses. The penicillin controls and clears the septicaemia, but marrow cultures performed on metaphyseal abscesses after patients have been on massive doses of penicillin yield profuse growths of an organism, usually a staphylococcus aureus sensitive to penicillin, long after the blood cultures have been negative. What happens is that the patients survive and look well but that the osteomyelitis goes on to chronicity with recurrent flare-ups.

We treat our cases by drilling the lesions of the long bones in order to decompress them at the earliest possible moment; that is to say, after attention to fluid and electrolyte requirements, blood transfusion if necessary (and it is always necessary during the operation), and at least 12 - 24 hours of antibiotics, usually penicillin and streptomycin.* For osteomyelitis of the neck of the femur we drill the neck, through a lateral incision, with a hand-awl and with radiographic control, in much the same way as a guide-wire is inserted before putting in a trifin nail, but for the very opposite reason, viz. to see that the epiphyseal plate is not traversed.

Theoretically, there should be an early stage of the lesion when penicillin, alone and without decompression, should suffice. It is doubtful, however, whether such a stage ever exists by the time a diagnosis is made, or whether it could be differentiated from a state of affairs which does require decompression.

Every effort should be made to avoid bone sclerosis because of its detrimental effect on chemotherapy and its high yield of chronic osteitis.

Our cases, then, are drilled and are given antibiotics, these being changed if necessary upon receipt of the report on blood culture or pus-swab culture. The wounds are drained, and the patient's limb completely immobilized, usually in a plaster cast. On the 5th day the drain is removed under strictly aseptic conditions through a window cut in the plaster, and on the 10th day the sutures are similarly removed. Plasters are changed at regular intervals and radiographs taken at the same time. Weekly ESRs, white-cell counts and haemoglobin estimations are carried out, all being recorded on a special chart.

The temperature does not return to normal immediately but usually takes an average of 4 - 6 days to do so—the time actually varying between 1 day and 48 days. Immobilization and antibiotics are continued until clinically and radiologically

* We have recently thought it advisable to commence treatment with penicillin and chlortetracycline instead of streptomycin.

there are no signs of activity and until 2 successive ESR estimations are below 20 mm. in the first hour. The duration of immobilization is reflected in Fig. 5. The patient is then allowed up, and is fitted with a weight-relieving caliper, which is discarded when successive radiographs indicate good calcification. The caliper does not always achieve its original purpose, but it does effectively limit the child's activity.

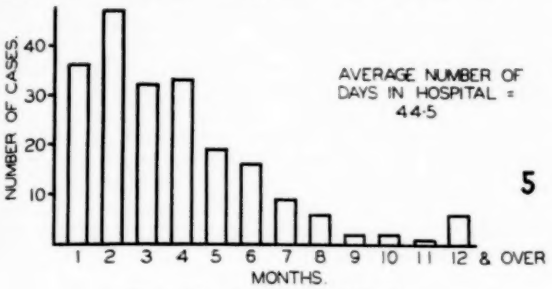

Fig. 5. Duration of immobilization.

At this stage active physiotherapy is begun in order to mobilize the joints and increase muscle power. The average stay in hospital is 44½ days.

Results

I have analysed the results in two main sections. The first (Table III) is the result as assessed from the case notes and

TABLE III. RESULTES OF TREATMENT

Nature of Treatment	*No. of Cases*	*No. with Complications*	*Percentage*
Conservative non-operative treatment	30	10	33·3
Incision and drainage only	37	14	37·8
Incision and drilling of bone (medullary decompression)	202	24	11·8
Surgery without wound drainage	55	23	41·8
Surgery with wound drainage	186	35	18·8

Mortality following surgery—5 *cases*—1·7%

all relevant documents available; that is, without any follow-up. It will be seen that the method of treatment was by no means a uniform one. This is because these patients were treated by different surgeons; nowadays there is considerably more uniformity of management. I have indicated the nature of the treatment in some detail to assess the results with as much accuracy as possible. By complications I refer to anything including sequestrum, fracture, sinus, a second operation, wound sepsis, etc.

The results of conservative treatment, and of incision and drainage only, are very similar. It should be emphasized that, although the metaphyseal abscess has spread to the subperiosteal region and while this is often described as the bone having decompressed itself, this is not the case. One has frequently drained such an abscess only to find that on drilling the bone pus escapes under considerable tension. The bone must be drilled, and in these cases the complications are only one-third of those in the previous two groups, where the bone is not drilled.

The presence of a drain in the wound likewise resulted in only one-half as many complications as in those cases in which the wound was not drained. This is not surprising; few surgeons drain an abscess and close it again at the same operation.

Five children died—a mortality of 1·7%. One died of malnutrition 4 months after the operation. The remaining 4 died within 17 days of admission of septicaemia, with pericarditis, pyelonephritis, and multiple pyaemic abscesses in lungs, myocardium, kidneys, liver, etc. Of these 4 patients, 3 were infected by a staphylococcus aureus sensitive to all the antibiotics, and one was infected by a similar organism sensitive to all the antibiotics except penicillin.

As regards follow-up: I managed to trace 109 of the 300 patients and the follow-up period ranged from 1 to 7 years, most cases being seen 3 years and more after their initial disease. Here the results have been recorded as good or bad (Table IV). By 'good' is meant patients who have had nothing in the way of symptoms or signs to indicate chronicity

TABLE IV. LATE RESULTS: 1-7 YEARS FOLLOW-UP

Nature of Treatment	*No. of Cases*	*Results*	
		Good	*Bad*
Conservative non-operative ..	6	4	2
Incision and drainage only ..	4	4	0
Incision and drilling of bone ..	99	86	13
	109	94	15
		86·2%	13·8%

or activity. All had 100% normal function. All were radiographed and showed some sclerosis and periosteal reaction but no signs of activity or sequestra or rarefaction. Anybody, for whatsoever reason, not able to be classified as good, was called a bad result. It is clear that 86·2% of patients have done well.

It is interesting to compare our figures with those published elsewhere (Table V).

TABLE V. SUMMARY OF RESULTS IN OTHER SERIES

Author	*No. of Cases*	*No. followed up*	*Good Results*	*Percentage*	*Mortality*
Butler,[15] 1940	500	253	127	50	2
White and Dennison,[17] 1952	212	78	60	76·9	1·2%
Trueta and Morgan[8] 1954	100	100	94	94	nil
Du Plessis,[16] 1953	33	16	16	100	6%
Tucker and Hollenberg,[18] 1948	19				
	10 drilled	10	10	100	nil
	9 conservative	9	4	44	
Bremner, Neligan and Warrick,[19] 1954	23				
	12 drilled	12	12	100	nil
	11 conservative	11	11	100	nil
			5 operated		
			3 not proved		
Altmeier and Largen,[13] 1952	110	110	79	71·8	nil
Caldwell and Wickstrom,[20] 1950	94	67 (75 lesions)	62	82·6	nil
Present series, 1959	300	109			
		6 conservative	4	66	1·7%
		4 drainage only	4	100	
		99 drilled	66	87	

Firstly—to indicate the appalling pre-war mortality and the disappointing results of treatment, which in very many cases included amputation,—there is the largest series ever

published—that of Butler[15] in 1940—500 cases collected, however, over a period of 18 years.

Trueta[9,10] has written frequently on this subject and, in his unit at the Wingfield-Morris Hospital in Oxford, achieves extremely good results.

Tucker and Hollenberg,[10] du Plessis,[16] and White and Dennison,[17] treat osteomyelitis on the lines I have outlined in this article.

Bremner, Neligan and Warrick[18] treated 2 small comparable series by the two methods available, viz. conservative and radical, and cured 100% of their cases in each group. But of the 11 cases treated conservatively, they admit that 5 were operated upon. Furthermore, on reading their paper critically, and also those of Altmeier and Largen[19] and Caldwell and Wickstrom,[20] who all rely on conservative antibiotic treatment with aspiration of subperiosteal abscesses if present, one must point out that the grounds for including many of their cases are slender. They include many cases where there are no radiological signs whatever and, as these cases are not operated upon, the presence of pus cannot be confirmed. In many cases, therefore, the grounds for diagnosis are suspect, and certainly osteomyelitis cannot be proved. One must as a consequence regard their figures as being very sanguine.

Now in the present series one or both of the following criteria had to be satisfied before any cases were included in the review: There had to be pus in the bone as found at operation and confirmed by culture, and/or definite radiological evidence of serial changes in the bone affected, consistent with the presence of a pyogenic infection.

It is clear, then, that the results of metaphyseal decompression are superior to those of conservative treatment and we feel fully justified in continuing our method of treatment.

We have come a long way since the days when this disease was highly fatal, and that in the main must be ascribed to the introduction of penicillin. However, there is no room for complacency and the clinician must constantly be alert to the possible presence of this disease. In 1928 Sir Harry Platt[21] said: 'Acute osteomyelitis must be given pride of place in the clinical consciousness of the practitioner....a small incision down to the metaphysis at the point of tenderness and puncture of the bone by means of a series of drill holes will save many limbs and many lives'.

Acute haematogenous osteomyelitis must still be regarded as a surgical emergency calling for extreme vigour in the management of its initial stage.

SUMMARY

300 cases of acute haematogenous osteomyelitis seen at the Red Cross War Memorial Children's Hospital and Groote Schuur Hospital, Cape Town, are reported. This series represents the highest published incidence in the world.

The age, sex and race incidence and possible aetiological factors are discussed and the importance of the regular and repeated estimation of the erythrocyte sedimentation rate as therapeutic guide is indicated.

Bones involved and causative organisms are analysed.

The results of treatment both in this series and others indicate that surgical decompression of the metaphysis combined with adequate prolonged antibiotic therapy is the treatment of choice, and that in all cases the bone should be drilled and the wound drained.

I should like to express my great indebtedness to Prof. J. H. Louw for his constant encouragement, advice and support in this undertaking. I am grateful to Drs. D. R. de Villiers and S. Cywes for their aid in extracting the relevant case-notes at the commencement of this survey in 1957. Thanks are due to the Medical Superintendents of the Red Cross War Memorial Children's Hospital and Groote Schuur Hospital for access to case records.. Prof A. Kipps and Dr. D. McKenzie and their respective Pathology Departments have cooperated to the full at all times. Finally thanks are due to Mr. G. McManus, of the Department of Surgery, University of Cape Town, for his photographic help.

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ACCIDENTAL ACUTE IRRADIATION FROM COBALT-60

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The accidental exposure of a traffic policeman in the Transvaal to a radio-active cobalt-60 source during December 1959 received considerable publicity in the press. As far as I am aware this is the first case of its type in South Africa and as the clinician in charge of the case from the fifth day after exposure I write this note on the management of such cases in general and on the management of this case in particular.

CASE HISTORY

On Tuesday 1 December 1959 at about 3.30 p.m., a car carrying a capsule of cobalt-60, which was to be used for metallurgical purposes, was involved in an accident 40 miles from Johannesburg. The lead container in which the capsule had been placed apparently broke open in the accident.

A traffic policeman, aged 32, arrived on the scene of the accident shortly after its occurrence. He stated that, in the process of carrying out his routine duties, which included the disposal of the injured and a search for the third-party-insurance disc of the crashed car, he came across a small capsule of about 6 by 2 cm., which he thought looked like a 'condenser'. He said that he picked it up and for about 5 minutes was playing with it from one hand to the other whilst proceeding about his duties at the scene of the accident; that he then placed it in the left thigh pocket of his motor cyclist's raincoat, where to the best of his memory it remained for about 20 minutes; and that then he placed it in the car and for the next hour or so was within 5 - 15 feet of the capsule whilst walking about the scene of the accident. Up to this stage, he said, he was not aware of the radio-active nature of the capsule.

The raincoat was double-breasted, buttoned down to the bottom, which was at knee level, and with the belt fastened. It

seemed likely therefore that the coat pocket would have been retained at a fairly fixed distance from the skin of the left thigh. The pocket was over the upper anterior and lateral part of his left thigh extending down to a distance of about 10 - 12 inches from the iliac crest, the bottom of the pocket being between 10 and 15 cm. from the gonads. The distance of any object in the pocket from the skin would have been between 1 and 3 cm.

He continued at work for the next few days, during which period there was no nausea or vomiting or loss of appetite. He felt somewhat fatigued but he did not emphasize this feeling. The press reported the incident widely.

On Friday 4 December he received an instruction to proceed to Johannesburg to visit a radiologist for an examination. He stated that whilst bathing before leaving for Johannesburg he noticed, at a place later measured to be 12 inches below the left iliac crest, a symptomless red patch of skin about 1½ inches in diameter, and that on the way to Johannesburg he felt a burning sensation in this area but at that time there was no itch.

After his visit to the radiologist, when blood was taken for testing and photographs were taken, he returned home and the red spot began to itch. He noticed then that there were two other spots which began to itch above and lateral to the original point and in close proximity to it. He also noticed a spot of redness and itching on the right thigh symmetrically opposite to the original spot on the left thigh.

Later in the evening of 4 December, the itch at these spots became worse and a generalized intolerable itchiness appeared on the trunk and limbs. At about 10 p.m. he went to see his doctor, who diagnosed an urticaria-like eruption. It was not a flat erythema. In the course of the afternoon and evening he had no unusual food or drink.

He was given 40 mg. of cortin intramuscularly but the itch became so intolerable and he felt so unwell in general that he was admitted to the local hospital and was given 200 mg. of solucortef intravenously in 2 litres of fluid, and anthisan and meticortin by mouth. He was afterwards given chlortrimetron.

Transfer to Johannesburg General Hospital

On Saturday 5 December the itch continued, and he was transferred to the Johannesburg General Hospital for observation and investigation. At the time of admission no information was available about the amount of radio-activity of the cobalt-60 source. Cobalt-60 is a beta and gamma emitter, the gamma rays with their long pathlength are the significant ones under the circumstances of this case.

The patient's only complaint at the time of admission was of persisting itch. His general condition was normal apart from some concealed anxiety, due, it was considered, to what he had read of his case in the newspapers and to the chatter of his acquaintances concerning the frightful things that might happen to him. His temperature and pulse were normal.

On the left anterior and upper part of the left thigh there were 3 excoriations caused by scratching, each one the size of a half-crown. There were also extensive scratch marks and rubbings over his limbs and trunk and over his face and forehead. There was a single patch of excoriation at the site of the area of redness which he had described on the right thigh symmetrically opposite the original patch on the left.

In the absence of information concerning the amount of radio-activity of the source to which he had been exposed, and in spite of the absence of the nausea and vomiting immediately after exposure which would have accompanied a considerable total body dose of ionizing radiation, it was considered wise to manage the case as if he had been exposed both locally and generally to a dose that might be followed by pathological effects.

As I entered the ward to see the patient I noticed a copy of a newspaper with a headline stretching across 4 columns COBALT BOMB VICTIM IN HOSPITAL. In the report appeared a photograph of the patient and immediately under the photograph was an account of a press interview with an un-named radiotherapist who had indicated the effects—local and general, immediate and remote—that might be produced in a person exposed to ionizing radiations. Bleedings and leukaemia were mentioned. It was natural for the reader to infer that what was mentioned in the report might happen to the person whose portrait appeared above the report. I therefore tried to assess the patient's reactions to the publicity which his case had received. He was a man of extrovert temperament and he stated that he took no notice at all of what was being published about him in the newspapers. He later said that his wife was very worried about what might happen to him. I asked him to ignore any unpleasant reports he might read and any gloomy and hair-raising stories his friends and acquaintances might tell him, and to trust us to keep him informed of the true state of affairs. I told him that leukaemia has not been shown to be a long-term hazard of single-dose total body irradiation.

The white-cell count showed 18,000 white cells per c.mm., with a differential count of 69% neutrophil polymorphs, 23·5% lymphocytes and 7·5% monocytes. The sternal marrow was counted and stained with Jenner-Giemsa; the cell count was 216,000 per c.mm., the differential count was normal, and no abnormal marrow cells were seen.

On Sunday 6 December provisional information was received that the cobalt-60 source was about 1 curie. Cobalt-60 emits radio-activity at the rate of 13·3 roentgen per millicurie per hour measured at 1 cm. distance. At 1 cm., the dose from 1 curie in ⅓rd of an hour would be $\frac{1000 \times 13 \cdot 3}{1 \times 3}$ roentgen, namely 440 roentgen skin dose at 1 cm. from source. At 15 cm., applying the inverse square law, the dose would be $\frac{1000 \times 13 \cdot 3}{15^2 \times 3}$ roentgen, which is about 20 roentgen. One could conclude that the total body dose under the described circumstances was insignificant. Nevertheless, pending receipt of an official report from the physicists of the Council for Scientific and Industrial Research and the Atomic Energy Board it was decided to carry on observing the patient as if he had been subjected to a significant body dose, i.e. significant in the sense that it might at least temporarily affect his bone marrow.

Daily white-cell, platelet and reticulocyte counts, haemoglobin and haematocrit estimations, and erythrocyte sedimentation rate estimations were instituted for 14 days, the period then to be lengthened if no abnormalities were found. Apart from a transient initial leucocytosis no abnormalities were found. The total white-cell count after the initial rise remained at 7,000 - 12,000 per c.mm., the differential count apart from a transient increase of eosinophils to 4 - 6% for a few days remained normal, the platelets never fell below 375,000 per c.mm., and the reticulocytes remained at 0·2 - 0·9%, the haemoglobin at 14·5 - 15·5 g.%, the haematocrit at 43 - 46%, and the ESR at 2 - 8 mm. in the first hour. All these estimations were normal at the end of the 8-weeks period of observations.

On 7 December photographs were taken of the thigh, pubic region and feet to serve as a base line for the observation of any later epilation or change in the growth of toenails and fingernails.

On 8 December Dr. T. H. Bothwell carried out an iron-turnover study using ^{59}Fe and reported the results as normal. Normal bone-marrow function on this the 8th day after exposure led to the inference that the marrow had permanently escaped any significant effect of ionizing radiation.

On 7 and 8 December the patient complained of a burning sensation in his testicles but there was nothing abnormal to observe. This was not complained of again.

Apart from platelet counts, clotting mechanisms were not examined. In the latest literature these have been generally reported to be normal after even severe total body irradiation with effects on the marrow.

By 8 December the itch had ceased and the patient felt normal.

On 10 December the official report of the radio-activity of the source and the estimated local skin, gonadal and total body doses were received from the CSIR and the Atomic Energy Board. The source had been measured as 1·75 curie. On the data available to the physicists, the local skin dosage was considered to be 900 roentgen, the gonadal dose 37 roentgen, and the total body dose 2·5 roentgen. The dosage was expressed in roentgen, applicable only to X-rays and gamma rays. The dose could have been expressed in rads (the tissue dose unit applicable to all forms of ionizing radiations). However, 1 roentgen is approximately the same as 1 rad under the circumstances of this incident.

The insignificance of this skin dose was explained to the patient on the lines that a local 'erythema' dose (600 to 1,000 r) produced an effect comparable to a patch of sunburn erythema. The estimated gonadal dose was explained on the basis that it was less than half of the mutation doubling dose, generally accepted as being between 50 and 80 r whether given in a single

exposure or over a life-span. The possible effect of such a dose on an individual's progeny was insignificant enough to be ignored. It was also explained that his potency would be unaffected, and that the male sterilizing dose is at least 20 times the maximum possible dose that he could have received with the capsule in his coat pocket. He was unwilling to have a sperm count done.

Out-patient Follow-up

The patient was discharged on 15 December 1959 feeling perfectly well, and arrangements were made to have regular blood and platelet counts done for another two weeks. No physical treatment had been indicated or given.

On 17 December, the patient was referred as an out-patient. He stated that on the evening of 15 December he noticed some red blood in his stool on one occasion. On the night of 16 December more 'rash' appeared on the left thigh, and a small blister developed on the back of the left hand. He said that he felt ill at the time but on 17 December was feeling perfectly well again. The patient was examined, and on the front of the left thigh about 10 inches from the iliac crest 3 superficial graze marks were seen, each the size of a half-crown, with a strange vertical lining which appeared due to a scratching process. On the back of the left hand there was a small blister about ¼ inch in diameter without surrounding erythema, comparable in appearance to a local thermal burn. The patient's general appearance and condition were normal. (The platelet count on 15 December, the day on which, as he stated, there had been blood in the stool, was reported as normal—475,000 per c.mm.)

I informed him that the lesions on the thigh and hand could not possibly be physically related to the effects of the ionizing radiations of 1 December. I hoped that this very positive line would prevent recurrence.

On 23 December he came as an out-patient once more, looking extremely well and feeling well. He had driven to Johannesburg on his motor cycle. There were no new eruptions and no local epilation on the thigh or elsewhere. Platelet count performed at his local hospital was reported as normal.

On 8 March 1960 he visited us again as an out-patient with a view to having a blood and sperm count done. He had no complaints. The blood picture was normal, with haemoglobin of 16·6 g.%, haematocrit 48%, white cells 11,400 per c.mm. and a differential count of 57% neutrophils, 29% lymphocytes, 6% monocytes, 7% eosinophils and 1% basophils. The ESR was 3 mm. in the first hour and reticulocytes 0·4%. The platelets were reported as normal in number and appearance. The sperm count by Dr. L. Schrire, of the South African Institute for Medical Research, showed a total count of 12 million per c.c., of which 40% were motile and 20% abnormal; volume 1 c.c. pH 7·2. After 24 hours there were 17% motile forms. The report read, 'This specimen of seminal fluid shows a marked reduction in the number of spermatozoa and a reduced proportion of motile forms. These findings could be compatible with a radiation effect but could equally well be due to a number of other causes'.

RELATIONS WITH PRESS

Reference is made above to the sensational newspaper reporting with which the patient and his family were confronted.

On 8 December I was asked to make a statement to the press, which was still reporting the case extensively, and through the Medical Superintendent of the hospital I arranged to meet representatives of two Afrikaans and two English papers and the South African Broadcasting Corporation to give them a factual account. Three of the press representatives were regular science-writer journalists. This procedure I considered to be of great importance in order to have as accurate reporting of the incident as possible both from the point of view of public information and from the point of view of the patient and his family.

A description was given of the manner in which ionizing radiations arise from fall-out, from reactor accidents, from radio-active spills, sealed and unsealed, from X-ray therapy and high-energy therapy machines such as 'cobalt bombs', and from background and cosmosphere. The physical effects on individuals following a total body dose below the lethal dose were described, and it was explained that these effects had not to date been observed in the present case. It was explained that it was impossible to forecast whether or not effects would develop within the next 10 days without a knowledge of exposure dose, and it was further pointed out that it would be undesirable to report dosage estimates even when known, because the public might easily get confused between local skin dose, gonadal dose, specific organ sensitivity, and total body dose. The difficulty of assessing the dose to which a subject of an accident has been exposed, even with the most modern facilities available, was also pointed out. The unhappy situation that arose in the present case from the publishing of the patient's photograph over the report of an interview describing the possible after-effects of total body irradiation was explained and appreciated.

After this press interview the subsequent reporting of the case by the newspapers, whose representatives attended the conference, was both accurate and sympathetic.

On 13 December a newspaper that had not been represented at the press conference published a report of an interview with an 'internationally known nuclear physicist' in which report the 'cobalt bomb victim' was advised 'not to be a father yet'. The unhappy effect of this report on the subject and his wife was anticipated and managed reassuringly.

DISCUSSION

The estimation of the local, gonadal and total body dose of irradiation in a radio-active spill or other accident is of the utmost importance from the point of view of diagnosing or anticipating the somatic and genetic effects. The difficulties of accurate assessment of dose are exemplified by the fact that at a uranium accident at Oakridge in 1958, reported by Marshall Brucer,[1] the assessment of total body dose by two groups of physicists working from the same data was a mean total body dose (for the 5 subjects exposed) of 200 rad from one group and 300 rad from the other.

In the present case, the absence of nausea and vomiting in the first few hours and days after exposure pointed to a very low body dose whilst the presence of skin erythema locally, if due to irradiation, pointed to a local skin dose of at least 600 r, the obsolete 'skin erythema dose' (for calculated doses see above).

Genetic Effects

The gonadal effect of ionizing radiation includes gene mutation, and reduced spermatogenesis up to a permanent sterility where the dose is 600 r or more. The effect of a 'gene mutation doubling dose', i.e. the dose that doubles the gene mutation rate that normally occurs during the 30 years of active reproductive life as the result of normal background radiation and other factors, is, according to geneticists' opinion, insignificant both as regards the effect on the progeny of an individual and as regards the effect on the population in general when the whole population is exposed to such doubling dose. The doubling dose is roughly estimated at between 30 r and 80 r, and it is agreed that the effect is the same whether this dose is given in 30 years or in one single exposure.[2]

What in fact is the estimated effect of the doubling dose genetically on an individual and on the population as a

whole? Various estimates have been made. Many are hazardous guesses rather than mathematical calculations. In 1958 the United Nations Scientific Committee on the Effects of Atomic Radiation[3] reported as follows: 'The Committee considers that the human race has sufficient reserve capacity for breeding to make the possibility of its slow extinction by reduced fertility of genetic origin due to doubling of the normal mutation rate by any mutagenic agent seem very remote.

In regard to the effect on the individual, the Medical Research Council's (Great Britain) 1956 report[2] states:

'If a gene defect-transmitted disease has a normal incidence of 1 in 500 births, the incidence of that defect on the progeny of someone exposed to a doubling dose will be 1 in 493'.

Many other reassuring estimates have been given by geneticists.

In the present cobalt-60 incident, the gonadal dose at the most was less than half the doubling dose and no effect on progeny need be anticipated.

The male sterilizing dose is about 600 r. Lesser doses will cause varying degrees of temporary lessened spermatogenesis, its duration being days, weeks or months, according to the dose. In the present case a sperm count was carried out 3 months after the incident, and showed a reduced count, for which any of a number of causes might have been responsible.

Potency is unaffected by radiation *per se*. Like any other general sickness, a total body dose large enough to cause general effects may be associated with impotence. Impotence of psychological origin may be induced iatrogenically or by the fears caused by alarming press reports and scare talk.

Somatic Effects

The effect of locally applied ionizing radiation must be carefully distinguished from the effect of total body irradiation. It is a commonplace that 10,000 r can be locally applied radiotherapeutically to a limb and produce virtually no total body effects.

The generalized pruritus complained of in our case is not a feature of total body exposure to ionizing radiations unless, according to Cronkite *et al.*,[4] that exposure be due to fall-out. Opinion seems to vary in regard to its incidence as a reaction to local radiotherapy of the skin.

In our case, the three discrete patches of erythema on the left thigh seem unlikely to have been an effect of radiation, unless scratching had obscured the true picture. The patch of itchy erythema that was stated to have appeared symmetrically on the right thigh, is consistent with a neurodermatitic type of lesion appearing symmetrically opposite the initial lesion (irrespective of its cause) in the corresponding neurodermal segment.

The total body dose is what determines the 'acute irradiation syndrome'. It is generally agreed that a total body dose of 1,000 r is almost always fatal in any period up to 4 or 5 weeks and shows its clinical effects at once by nausea and vomiting and skin erythema, with haematological and other effects following in a few days. It is generally agreed that a total body dose of 500 r carries about 50% mortality.

Five cases in the reactor accident at Oakridge in 1958[1] were exposed to between 200 and 300 rad total body dose. All 5 cases showed haematological effects and all recovered completely in periods of up to 5 months under treatment consisting of bed rest and reassurance. In the same accident, 2 other cases were exposed to 20 - 40 rad total body dose and showed no effects apart from a transient leukocytosis.

In Fig. 1 is shown a composite graph, compiled from Marshall Brucer's report,[1] indicating the clinical and haematological effects in the 5 cases exposed to 200-300 rad, but not effects on amino-acid excretion and serum proteins (there was early excessive urinary excretion of certain abnormal amino-acids, and an early rise and fall in serum albumin followed by a secondary temporary rise some weeks later).

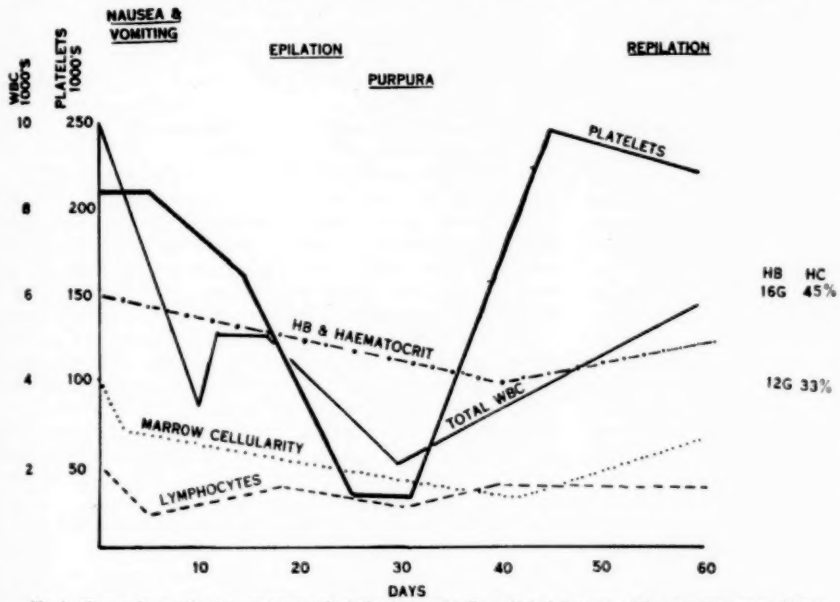

Fig. 1. Composite graph of mean haematological values and salient clinical features of 5 cases exposed to 200 to 300 rad total body dose. Compiled from data published by Marshall Brucer[1] in 1959.

Early nausea and vomiting were present in all cases, but erythema was absent. Epilation mostly in the scalp but also elsewhere, took place from about the 3rd week, and recovered within 6 months. The incidence of purpura coincided with the fall of the platelet count from about the 14th day. The platelet counts in all cases fell at a consistent rate and time after exposure, and returned to normal within 6 weeks. The white-cell counts in all 5 cases fell at about 4 weeks to about 2,000 per c.mm. The lymphocytes showed a drop within two or three days and then returned to normal in about 2 weeks.

The proliferative capacity of the marrow was estimated by the tritiated thymidine technique and was shown to be temporarily reduced during the early stages. The mitotic index of the marrow was also temporarily reduced. Both these tests indicated reduction of marrow function.

In our case we did not have facilities for the tritiated thymidine technique, but the iron turnover estimated by

the ^{59}Fe technique is an index of marrow function and this was normal on the 8th day after exposure. There was no change in the serum protein-pattern in our case on the 6th day; the haematological studies indicated that the marrow and peripheral blood remained structurally and functionally normal.

The induction of body radio-activity by neutron or very heavy gamma bombardment of the body's sodium, which can be measured during the few days it lasts by whole-body counter or serial linear scans,[1] did not arise in our case by reason of the minute total body dose concerned.

Discussion of the treatment of the acute radiation syndrome is beyond the scope of this case report.

The Press

In these cases good public relations are intimately interwoven with the whole subject of radio-activity. The attitude of the public to ionizing radiations and particularly to accidents in which people singly or in small or large groups are exposed to their action must be positively guided.

The atomic energy establishments of the USA and Great Britain which I visited under the auspices of the World Health Organization during 1958 - 59 all emphasize the need to have an effective public relations department through which information concerning their work and any accidents is presented to the press. Press reports are all handled by the public relations office, and no member of staff, medical or other, is permitted to make statements to the press. The result is the publication of scientifically accurate reports, which nevertheless can be mishandled by sensational headlining or by the omission of essential parts.

The press is the most important single influence in keeping the public informed on any matter. The World Health Organization[5] has reported on an analysis of press reporting on atomic energy. In 504 press cuttings from 31 countries in 1 year (1956 - 57) in which the common factor was reference to the work of WHO, by far the most widely covered subject was atomic energy, and the emphasis was upon the dangers—the risk of harm to genetic and somatic health from fall-out, radio-active waste, food contamination, and the medical use of X-rays. One 'quality paper' of Great Britain gave an average of 1,500 words daily to atomic energy during that year. It was emphasized that a report prepared for the public by nuclear physicists, physicians and experienced public relations officers of atomic energy institutions, no matter how well balanced, accurate, and intelligible to the average layman, can be ruined in so far as its intended effect upon the public attitude is concerned by the headlines chosen to feature it. Such a report, for instance, appeared under a banner headline of ATOMIC SUICIDE.

In our cobalt-60 incident, one daily paper referred in its 4-column headline to COBALT BOMB ACCIDENT. This title appeared not long after the installation at the Pretoria General Hospital of the teletherapeutic 'cobalt bomb' of a radio-activity 1,000 times as great as that of the cobalt-60 capsule concerned in our case, when the power of ionizing radiations and the great precautions that had to be taken to prevent their damaging effects on man were reported in the press. The unhappy results of the publication of interviews with 'authorities' who are unaware of the features of the particular accident are also well exemplified by two other reports mentioned above. One was the interview with a radiotherapist which was published under a photograph of the patient, and the other was an interview with an unnamed 'internationally known nuclear physicist' visiting Johannesburg, reported under the 3-column headline COBALT BOMB TRAFFIC COP TOLD: DON'T TRY TO BE A FATHER YET.

There is therefore good reason to support the view that reports, at least on accidents, should be accepted by the press only from authorities concerned to prevent both individual hurt and public alarm and panic. Whether the publicity given to ionizing radiations has in fact caused significant psychological damage is a difficult question to answer. The emotional reactions to reports of danger and risk from ionizing radiations are fear, resentment and anger. In my WHO tour I heard accounts of individuals, including medical practitioners, who refused to allow themselves or their families to be diagnostically X-rayed because of the dangers of ionizing radiations. But these were few. On the other hand, I met many practitioners and physicists who were nonchalantly exposing themselves to ionizing radiations in what appeared to be very considerable ignorance of their biological effects.

Dr. K. Soddy, psychiatrist at University College Hospital, London, who was rapporteur of the WHO Committee on the Mental Health Aspects of the Peaceful Use of Atomic Energy, informed me that his committee had received reports from psychiatrists of 8 countries to the effect that reference to atomic energy are absent from the expressed symptom-content of psychiatric patients, both psychoneurotic and psychotic. Occasionally, references were made to the fear of atomic-bomb explosions. This it was agreed was in striking contrast to the incorporation into the delusional systems of psychiatric patients of other physical phenomena such as electricity, radio and radar. It was, however, agreed that the impact of the attitudes to atomic energy on very young children may become manifest in the next few years as those attitudes become incorporated into psychiatric and psychoneurotic symptomatology; but it was pointed out that this has not yet happened in Japan, where exposure to the first fearful atomic blast in history occurred 15 years ago.

Should a positive approach be taken in keeping public attitudes reasonably attuned to scientific accuracy? The answer, at least for the time being, is in the affirmative.

In my opinion—an opinion in keeping with the practice of all atomic establishments visited—the press as the most powerful controller of public attitudes should be well informed. The journalistic science writers should, by press interview or other means, be informed by nuclear physicist and physician about the science of nuclear physics and nuclear medicine, so that they can understand the implications of the news they handle and publish. In my own experience, the science writers are only too keen to know something of the principles and facts of ionizing radiation and their effects on biological systems. The cooperation of journalistic science writers in Johannesburg in the present case was notable

The medical profession, too, must be informed. Unfortunately there is a feeling that those who press the dangers of ionizing radiation, who naturally are mainly radiologists, have an axe to grind and are exaggerating such dangers. This feeling is present in most countries. It is associated with the fear that the right of the non-radiological medical

practitioner to use an X-ray screening or film set will be denied by legislation. Nevertheless, medical practitioners untrained in the use of X-rays, and apparently unaware of their potential danger, may nonchalantly flout the ordinary rules of safety, and today reports regularly appear of self-inflicted X-ray 'burns' through carelessness and ignorance on the part of non-radiologists. Less tangible effects, such as gene mutations, are not immediately measurable.

Medical students, too, must be informed of the biological effects of ionizing radiations; so must physicists. In 1958 a British committee was enquiring into the instances of biological damage that people have sustained in University physics laboratories, some of which were far from biologically minded and a few of which were apparently antagonistic to the introduction of the theme of biophysics, including radiobiology, into their departments.

SUMMARY

1. The features of an accident in which a capsule of cobalt-60 of 1·75 curie radio-activity became a source of potential danger to man are described.

2. The biological effects of ionizing radiation applied to the gonads and to the whole body ('total body dose') are briefly discussed.

3. The method of clinical and laboratory investigations of an exposed case is described. The average teaching hospital laboratory can provide the essential tests necessary for the proper management of such cases. The physical facilities for the estimation of dose to which a subject has been exposed must be provided and used expeditiously in such cases.

4. In the present case no untoward somatic effects of ionizing radiations were found. Some insignificant and unimportant local skin erythema might have been due to the ionizing radiations. The findings of a sperm count carried out 3 months after the exposure were compatible with a radiation effect but could have been due to other causes. The gonadal dose at its worst was well under the doubling mutation rate dose. There were no symptoms or signs of the acute radiation syndrome.

5. The importance of the management of the psychological aspects and the importance of keeping the public informed, particularly through the press, is discussed.

My thanks are due to Dr. K. F. Mills, Medical Superintendent of the Johannesburg General Hospital, for permission to publish details of this case, and to Dr. T. H. Bothwell, working on a grant from the South African Council for Scientific and Industrial Research, for the radio-active-iron study.

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CLOSTRIDIUM WELCHII INFECTION FOLLOWING ABORTION

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The death rate from abortions is still appalling. At Groote Schuur Hospital alone, 24 patients died from this cause during the past 5 years. Although there was a marked drop in abortion mortality between 1942 and 1952 in England and Wales, the incidence has remained practically unchanged since 1953 (Table I).[1] The effective treatment of haemorrhage and the control of most cases of sepsis by antibiotics were no doubt responsible for the earlier improvement. The present stalemate is due to the fact that certain causes of death have remained unchanged and become relatively more important. These residual causes require greater attention if a further saving of lives is to be achieved. Prominent amongst them is *Clostridium welchii* infection.

During the year 1 July 1958 to 30 June 1959, 1,436 incomplete abortions were treated at the Groote Schuur Hospital; of these 502 were septic. *Cl. welchii* infection was a prominent factor amongst the seriously ill and fatal cases. There were 10 such cases, representing an incidence of 1 in 140 abortions and 1 in 50 septic abortions; 3 of these 10 died. In view of the increasing importance of this infection, the subject is reviewed in the light of our experience at Groote Schuur Hospital.

TABLE I: DEATHS FROM ABORTION: ENGLAND AND WALES (REGISTRAR GENERAL)[1]

1942	313	1952	90
1944	313	1953	76
1946	157	1954	76
1948	125	1955	68
1950	103	1956	72

The *Cl. welchii* organism was isolated independently in 3 countries in 1892 and has since been commonly called after the name of one of its discoverers. It is a short gram-positive rod, non-motile and encapsulated. It is an anaerobe, fermenting sugars to produce an inflammable mixture of carbon monoxide, carbon dioxide and hydrogen. The clinical features are largely due to the effects of two of the toxins which it produces; a myotoxin which causes disintegration of protein with the production of gas, and a haemotoxin which destroys red blood corpuscles.

Considering its wide distribution, *Cl. welchii* infection is less common than might be expected. The organism is present in the vagina of about 5% of healthy pregnant women,[2] and has indeed often been found in the floor dust of labour wards and on the hands of attendants.[3] The discrepancy between opportunity and infection has occupied the attention of numerous workers. All are agreed that the presence of dead or traumatized tissue is essential for the production of the infection. Another important factor is the virulence of the organism. Butler[4,5] investigated this aspect and found over 600 different strains; severe infections are produced by only 5% of the strains—those which are heavily encapsulated and resistant to phagocytosis by human leucocytes, produce an alpha toxin and are fatal to guinea-pigs. Russell and Roach[6] laid down two other postulates

for growth, namely, that the organism must be introduced *into* the uterus and the dead or damaged tissue must remain in the uterus for a sufficient time for incubation. It is no wonder, then, that *Cl. welchii* infection is so much commoner after abortion than after childbirth and it is particularly favoured by criminal methods of procuring abortion, including the use of a syringe. In 6 out of the 10 cases described here, such a history was obtained.

CLINICAL FEATURES

Although *Cl. welchii* has often been cultured in cases where it does not appear to affect the clinical picture, yet true infection with the organism produces a most serious condition. The clinical picture is then related to the effects of the bacillus and the myotoxin and haemotoxin it produces. The haemotoxin haemolyses red blood cells and the myotoxin causes disintegration of protein (including renal and hepatic epithelium, muscle, and blood vessels) with the production of gas. The cases encountered at the Groote Schuur Hospital demonstrate the various clinical types, which can be conveniently classified as follows according to the groups proposed by Douglas *et al.*[7]

1. *Cl. welchii present in the Vagina*

Here it may be a harmless saprophyte, and such cases are not included in the present series. In the bacteriological service at Groote Schuur Hospital, virulent strains are tested for, and the presence of *Cl. welchii* is only reported when such strains are present. On the basis of the presence of *Cl. welchii* in 5% of normal vaginae, one would have expected about 70 such cases in the group of abortions under review.

2. *Local Uterine Infection*

It is extremely difficult to diagnose these cases and to distinguish them from infection with the less dangerous organisms. Diagnosis will depend on the bacteriological report, which involves a delay of a few days. In the meantime *Cl. welchii* infection should always be considered—and vigorously treated—when the abortion is criminally induced, or when pyrexia, tachycardia or hypotension is marked. The presence of gas in the tissues, jaundice, or anuria makes the diagnosis much more likely.

Case 1. H.S., aged 32 years, gave a history of 3 months' amenorrhoea and having attempted to induce an abortion 2 days before. This was followed by severe lower abdominal pain and some vaginal bleeding. She was found to be shocked. (BP 50/30 mm. Hg, pulse rate 110 per minute). Temperature 101·4°F. Slight lower abdominal tenderness. Cervix patulous, and uterus enlarged and tender. She was put on penicillin (2 million units 6 hourly), antiserum, and levophed, and responded to this treatment, passing the ovum 24 hours later. For a week pyrexia and tachycardia continued, and then all abnormal physical signs disappeared. The cervical swab showed *Cl. welchii* and coliform bacilli.

Case 2. E.J., aged 19 years, was admitted with a history of having had a 3 months abortion induced 24 hours before, but the bleeding had continued. She looked ill; temperature 103° F. and pulse 110. Lower abdomen slightly tender; offensive vaginal discharge; products of conception felt protruding through the cervix. Uterus the size of a 10 weeks pregnancy; adnexa normal. She was treated with penicillin and streptomycin. The temperature and pulse became normal in 48 hours, but by that time the bacteriological result was received, reporting the presence of *Cl. welchii* and *Staph. aureus*. Accordingly no evacuation was performed but the dosage of penicillin was increased. After 7 days *Cl. welchii* was no longer isolated, the pelvic condition was normal, and she had made a complete recovery.

Case 3. M.V., aged 20 years, was admitted with a history of 14 weeks' amenorrhoea, followed by profuse vaginal bleeding. BP 80/40, temperature 98° F, pulse 120 and Hb. 10 g.%. Cervix dilated by a large mass of ovular tissue. The placental remains were removed digitally and 2 pints of blood given. She became pyrexial and was put on penicillin and streptomycin. A cervical swab revealed a heavy mixed growth of *Cl. welchii*, beta haemolytic streptococcus, and *Proteus mirabilis*, and the dosage of penicillin was increased and chloromycetin was given as well. For a further week pyrexia and tachycardia continued, and then she recovered.

Case 4. S.K., aged 38 years, was admitted with a history of a 3 months abortion 6 hours before. Temperature 102° F, pulse 120, Hb. 10 g.%, BP 80/50. She was transfused and put on penicillin and streptomycin. Cervical swabs showed a profuse growth of *Cl. welchii* and a scanty growth of coliform bacilli and *Staph. aureus*; and the dosage of penicillin was increased. Pyrexia continued for a further week and then the temperature gradually subsided. By this time pelvic examination showed that the abortion was complete.

Case 5. C.A., aged 19 years, had an induced abortion 3 days before admission and stated that she had passed very little urine since that time. The uterus was about the size of a 10 weeks gestation, with patulous cervix through which placental tissue could be felt. In view of the anuria, *Cl. welchii* infection was suspected. Treatment was started immediately—penicillin in large dosage, antiserum, and treatment for anuria. Blood urea 218 mg.% and potassium 5·9 mEq./litre on admission; these rose gradually to 560 mg.% and 7·6 mEq./litre on the 18th day; and this was then followed by a decrease to normal. The urinary output was negligible for 10 days and then returned to normal. Temperature rose to 101°F on the 5th day. The cervical swab confirmed the presence of *Cl. welchii*. One month after admission the findings were normal.

Case 6. Y.M., aged 18 years, was admitted with a history of 4 months' amenorrhoea followed by vaginal bleeding of 2 days. Her general condition was good but the temperature was 101°F and there was an offensive vaginal discharge, bacteriological examination of which showed *Cl. welchii*. She was treated with penicillin and the temperature dropped to 99°F. Two days after admission profuse vaginal bleeding necessitated evacuation of the uterus, after which the temperature rose to 104°F but the pyrexia gradually settled and the patient was discharged on the 10th day.

3. *Pelvic and Peritoneal Spread, causing Peritonitis, Local or Generalized*

Here, again, the diagnosis is difficult and before bacteriological confirmation is obtained the features mentioned above should raise the suspicion of *Cl. welchii* infection.

Case 7. J.J., aged 30 years, was admitted on 7 August 1958, 4 days after a 3½ months abortion had been induced, soon after which she developed rigors and jaundice set in rapidly. Temperature 96°F., but pulse 120. She was pale (Hb. 5 g.%) and deeply jaundiced. Abdomen distended and tender, cervix patulous, and parametria thickened and tender. Vaginal swabs showed a heavy growth of *Cl. welchii*, coliform organisms, and enterococci. Blood urea 385 mg.%, serum bilirubin 9·3 mg.%. She was put on penicillin and transfused with 3 pints of blood. She passed 60 c.c. of urine daily and was treated as a case of lower nephron nephrosis. She died on the 5th day after admission, her pulse having remained elevated, although she never developed pyrexia.

Case 8. A.K., aged 26 years, was admitted on 3 April 1959 with a history of having been 2 months pregnant and having induced an abortion with a syringe the night before. Temperature 104°F, pulse 120. Tenderness and rigidity of lower abdomen. Placental tissue protruding through cervix. A vaginal swab was taken and the patient was put on penicillin. The pyrexia settled within 48 hours and an evacuation was performed. The next day the bacteriological report was received, *Cl. welchii* having been cultured. Tachycardia and abdominal tenderness continued for a further week, but all physical signs had disappeared in 10 days.

4. *Blood-stream Infection*

(*a*) *Bacteraemia.* The patient may show no evidence of systemic infection, or only local uterine sepsis.

(*b*) *Septicaemia.* In this condition negative blood cultures are frequent, because an anaerobe does not survive in the circulatory system for long.

Case 9. S.J., aged 27 years, was admitted on 9 November 1958 in a confused and stuporose state. A 3 months abortion had been induced the day before. Temperature 104°F., pulse 110. She was stuporose and at times violent, and presented the signs of a hemiparesis. Lower abdomen very tender; slight vaginal bleeding; uterus could not be outlined. Cervical swabs and blood cultures were taken and the patient was put on intravenous chloromycetin. Report received 3 days later—*Cl. welchii* and *Staph. aureus* in the blood culture, both organisms sensitive to chloromycetin. In spite of the chemotherapy the temperature remained in the region of 104°F, her pulse continued to rise, and she became completely comatose and died 7 days after admission. The urinary output was reasonably good throughout. Post-mortem examination showed a generalized pyaemia.

(*c*) *Metastatic gas gangrene.*

Case 10. H.J., aged 23 years, was admitted on 10 December 1958 with a history of 2 months' amenorrhoea followed by vaginal bleeding and pain in the legs for 1 day. Her temperature was subnormal, her pulse imperceptible, and her blood pressure unrecordable. There was lower abdominal tenderness which made the vaginal examination unsatisfactory. Marked subcutaneous emphysema of both legs, arms and abdomen. Penicillin (12 million units) and gas antiserum (120,000 units) were given, as well as levophed, cortisone and digoxin, but the patient died 11 hours after admission. A vaginal swab yielded a mixed growth of *Cl. welchii* and anaerobic streptococci.

As demonstrated by the above 10 cases, most patients develop symptoms within one or two days after the abortion. Depending on the severity of the infection, the patient may have chills, muscle pains, and collapse. The temperature may be high and persistent, or subnormal; the pulse is nearly always rapid, the blood pressure often drops, and there may be evidence of peripheral circulatory failure. The haemotoxin may produce acute haemolytic anaemia, with icterus and haemoglobinuria (case 7). The myotoxin may contribute to renal and hepatic dysfunction and may result in the production of gas in the tissues which may be felt as crepitus or be demonstrable by X-ray (although gas is said to be present in 20% of cases[8] it was only observed in 1 of the 10 cases in this series). Renal failure results in oliguria, anuria, and a rising blood urea (cases 5 and 7). The abdomen is often distended and tender. Laboratory findings show a leucocytosis of 20 - 40 thousands per c.c., an elevated serum bilirubin and, of course, the demonstration of virulent strains of *Cl. welchii* in cervical swabs.

TREATMENT

Before the advent of antibiotics, therapy was mainly local and consisted of douches, such as potassium permanganate, hydrogen peroxide, mercurochrome, or zinc peroxide. Gas-gangrene antitoxin was used but the results were disappointing.[9] Today, therapy consists of killing the organism with antibiotics, attempting to neutralize the toxin with antiserum, treatment of oliguria when present, supportive care, and possibly surgery in specially selected cases.

Most antibiotics have been tried against the clostridium organism, but penicillin in very high dosage was most frequently used in this series (8 million units daily, in divided doses, has been suggested, but if oliguria is present a smaller amount must be given). In our series, *Cl. welchii* showed a sensitivity to most antibiotics, although in 8 of the 10 cases the organism was insensitive to streptomycin; in only 1 case was it insensitive to penicillin. In all cases a variety of other organisms was found in addition to the clostridium. The suggested doses of antisera vary. One regimen[10] is to give 40,000 units intravenously 6 hourly for 8 doses, twice daily for 1 day, and then once daily for 2 days. Another method[11] is to give 50,000 units by the intramuscular or intravenous route 6 hourly for 4 - 6 days. Because of the danger of serum reaction and the uncertainty of its effectiveness, we only use antiserum when there is clinical evidence of activity of the *Cl. welchii* toxins (e.g. gas in the tissues, jaundice, or oliguria). Oliguria is treated on present-day principles, including the use of the artificial kidney, when indicated. Supportive care includes cautious blood transfusion and, when necessary, cortisone, levophed, or digitalis. The most controversial point in the treatment is the place of surgery and diametrically opposite opinions have been expressed in the literature. Mahn and Dantuono[11] curetted most of their cases within 24 - 48 hours, with a mortality of 73%. In our series curettage was not performed, if the diagnosis was known, but if placental tissue was protruding into and through the cervix, this was removed with minimal manipulation. We think that more extensive surgery should be reserved for cases where bleeding is severe or infection is prolonged and worsens in spite of conservative measures.

SUMMARY AND CONCLUSIONS

1. With the control of most other infections by antibiotics, *Cl. wechii* infection is assuming a relatively greater importance as a cause of serious illness and mortality after abortion. At Groote Schuur Hospital virulent strains of *Cl. welchii* were present and responsible for infection in 1 out of every 50 septic abortions; 10 such cases were encountered in 1 year, 3 being fatal.

2. The 10 cases are described; they illustrate many of the clinical features and the problems encountered in this type of infection.

3. To await laboratory confirmation of the presence of virulent strains might mean a fatal delay. The clinical grounds for suspecting the infection at an early stage, and the necessity for the institution of immediate and vigorous treatment, are discussed.

4. The complications and the methods of treatment are described, and illustrated.

We should like to thank Prof. James T. Louw, Professor of Gynaecology and Obstetrics, University of Cape Town, at whose instigation this review was undertaken, for his encouragement and advice. Prof. A. Kipps and the Department of Bacteriology carried out all the bacteriological investigations and gave valuable advice, which is gratefully acknowledged. Thanks are also due to Dr. J. G. Burger, Superintendent of Groote Schuur Hospital, for permission to publish data about the cases.

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INCOME TAX RELIEF THROUGH RETIREMENT ANNUITIES

Members will remember that the Association has been active for some time in crusading for 'Pensions for self-employed persons'.

The crusade has been successful and the Income Tax Amendment Act (Act No. 58 of 1960) makes provision for the approval by the Commissioner for Inland Revenue of 'Retirement Annuity Funds' established in order to allow self-employed persons to make adequate arrangements for their retirement. Approval by the Commissioner will allow the contributors to such a fund to deduct their contributions to the fund (up to a maximum of £300 *per annum*) from their taxable income before assessment.

The Commissioner will not approve any 'Retirement Annuity Fund' unless he is satisfied that:

1. The fund is a permanent fund *bona fide* established for the sole purpose of providing life annuities for the members of the fund or annuities for the widows, children, dependants, or nominees of deceased members; and
2. The rules of the fund provide:
   - (i) for periodical contributions by the members;
   - (ii) that not more than one-third of the total value of any annuities to which any person becomes entitled, may be commuted for a single payment, except where the annual amount of such annuities does not exceed thirty pounds;
   - (iii) adequate security to safeguard the interests of persons who may become entitled to any annuities;
   - (iv) that except in the case of a member who becomes permanently incapable through infirmity of mind or body of carrying on his occupation, no member shall become entitled to the payment of any annuity before he reaches the age of fifty-five years;
   - (v) that, where a member dies before he becomes entitled to the payment of an annuity, the benefits shall not exceed a refund to his estate of the sum of the amounts (with or without reasonable interest thereon) contributed by him and an annuity or annuities to his widow, children, dependants or nominees;
   - (vi) that a member's contributions shall cease as soon as he becomes entitled to the payment of an annuity;
   - (vii) that if a member prematurely discontinues his contributions he shall be entitled either to an annuity (payable from the date on which he would have become entitled to the payment of an annuity if he had continued his contributions) determined in relation to his actual contributions, or to be reinstated as a full member under conditions prescribed in the rules of the fund;
   - (viii) that, save as is contemplated in sub-paragraph (ii), no member's rights to benefits shall be capable of surrender, commutation or assignment or of being pledged as security for any loan; and
   - (ix) that the Commissioner shall be notified of all amendments of the rules; and
3. The rules of the fund have been complied with.

The Income Tax Amendment Act, passed just before Parliament rose, was only gazetted on 1 June and since this time officials of the Association have been busy drafting (in close consultation with the Department of Inland Revenue) a constitution for the 'Medical Association of South Africa Retirement Annuity Fund'. Provisional approval of the preliminary draft rules has just been obtained from the Department, but negotiations with the various insurance companies which have tendered to underwrite the Fund are still proceeding. It is hoped eventually to offer our members a choice of several schemes probably underwritten by more than one company.

It is, of course, impossible to finalize the details of the various schemes designed to suit the varying needs of our members before the end of this month, but members *may* still qualify for the tax concession in respect of the tax year ending 30 June 1960 by applying immediately to the Secretary of the Association, P.O. Box 643, Cape Town, for membership of the Medical Association of South Africa Retirement Annuity Fund. Applications should include the following particulars:

- (*a*) Name and address.
- (*b*) Date of birth.
- (*c*) Elected age of retirement (not before 55 or not later than 70).
- (*d*) The amount of the annual contributions which the applicant desires to make.

Applications must be accompanied by the member's cheque (made payable to the Medical Association of South Africa) to cover his contributions to the fund for the period 1 June 1960 - 31 May 1961. (**N.B.** Contributions may be varied from year to year but only by increase.)

Medical Association of South Africa
9 June 1960

A. H. Tonkin
Secretary

RELATIONSHIP BETWEEN DOCTOR AND PATIENT CONCERNING PRIVATE FEES — DISPUTES

The *Journal* has been requested to publish, for the information of members of the Medical Association, Section 80*bis* of the Medical, Dental and Pharmacy Act, No. 13 of 1928, which was incorporated into the Act under Section 27 of the Medical, Dental and Pharmacy Amendment Act, No. 29 of 1954. This Section of the Act lays down the procedure to be followed when a dispute between a doctor and patient arises in connection with the fee charged by the doctor.

It should, however, be pointed out that at its meeting in Cape Town on 21 - 26 March 1960, the South African Medical and Dental Council considered a proposal by Mr. W. H. Rood that an *ad hoc* committee be appointed to investigate the possible simplification of the cumbersome procedure at present to be followed by persons applying to the Council for assessment of accounts. Mr. Rood stated that the procedure discouraged people with genuine grievances from taking advantage of Section 80*bis* of the Act. After discussion the motion was accepted and a committee consisting of Dr. B. de Villiers, Dr. J. v. d. S. de Villiers, and Adv. vW. de Vries was appointed to investigate the matter and make proposals.

Following is the text of the present Section 80*bis* which was promulgated as Section 27 of the Amendment Act of 1954, and which relates to charges by registered persons other than chemists and druggists:

'27. The following section is hereby inserted in the principal Act after section *eighty*:

'80*bis*. (1) Every person registered under this Act (in this section referred to as the practitioner) except a chemist and druggist shall, unless the circumstances render it impossible for him to do so, before rendering any professional services inform the person to whom the services are to be rendered or any person responsible for the maintenance of such person, of the fee which he intends to charge for such services—

(*a*) when so requested by the person concerned; or

(*b*) when such fee exceeds that usually charged for such services,

and shall in a case to which paragraph (*b*) relates, also inform the person concerned of the usual fee.

'(2) Any practitioner who in respect of any professional services rendered by him claims payment from any person (in this section referred to as the patient) shall, within fourteen days after receipt of a request in writing to that effect provide the patient with a detailed account and such further information relating to the amount claimed as the patient may require.

'(3) The patient may within fourteen days after receipt of the detailed account and further information, if any, referred to in sub-section (2), in writing inform the practitioner that in his opinion the amount claimed is unreasonable and set out the grounds on which such opinion is based and shall at the same time transmit to the council particulars of the claim and of the said grounds.

'(4) The practitioner may within fourteen days after receipt of the grounds referred to in sub-section (3), submit to the patient an amended claim in substitution for his original claim and shall if he so submits an amended claim transmit to the council a copy thereof.

'(5) If no reply is received by the patient from the practitioner and no amended claim is submitted, or if an amended claim is submitted and the patient considers such amended claim also to be unreasonable, the patient may, within fourteen days after the expiration of the period referred to in sub-section (4) or after receipt of the amended claim, apply to the council for a determination of the maximum amount which the practitioner should have claimed from the patient in respect of the services rendered.

'(6) An application under sub-section (5) shall be accompanied by—

(*a*) an affidavit setting forth fully—

(i) the grounds upon which the patient's opinion that the amount claimed is unreasonable, is based; and

(ii) such facts relating to the amount claimed as the patient may wish to bring to the notice of the council; and

(*b*) a determination fee of five per cent. of the amount claimed.

'(7) The patient shall on the date upon which he transmits to the council an application under sub-section (5), transmit by registered post to the practitioner a copy of the affidavit referred to in paragraph (*a*) of sub-section (6), and the practitioner shall within fourteen days after receipt thereof submit to the council an affidavit setting forth fully—

(*a*) any representations he may wish to submit in support of his claim; and

(*b*) such facts relating to the amount claimed as he may wish to bring to the notice of the council.

'(8) Upon receipt of an application under sub-section (5), the council shall appoint not less than two and not more than five of its members as assessors who shall determine the maximum amount which in their opinion the practitioner should have claimed from the patient in respect of the services rendered.

'(9) The assessors shall for the purpose of making a determination under sub-section (8), afford both the practitioner and the patient an opportunity of submitting by affidavit such representations, in addition to any representations submitted under sub-section (6) or (7), as they may wish to put forward for consideration by the assessors.

'(10) Any determination made under sub-section (8) shall be communicated by registered post to the practitioner and the patient and shall, subject to the provisions of sub-section (11) and (12), be final and binding on them.

'(11) Any practitioner or patient who considers himself aggrieved by a determination under sub-section (8) may, within thirty days after the date thereof and upon payment to the council of a review fee of five per cent. of the amount determined under that sub-section, apply to the council for a review of the determination.

'(12) Upon receipt of an application under sub-section (11), the council or, if the amount claimed is less than one hundred pounds, its executive committee, shall review the determination of the assessors and may confirm that determination or set it aside and determine anew the maximum amount which the practitioner should have claimed from the patient in respect of the services rendered.

(13) The provisions of sub-sections (9) and (10) shall apply *mutatis mutandis* in respect of a determination on review under sub-section (12).

'(14) If the amount determined under sub-section (8) is less than ninety per cent. of the amount claimed, and is not on review under sub-section (12) increased to ninety per cent. or more of the amount claimed, the patient may recover from the practitioner an amount equal to the determination fee.

'(15) If the amount determined on review under sub-section (12)—

(*a*) is less than ninety per cent. of the amount claimed and less than the amount previously determined under subsection (8), the patient may, where application for review was made by him, recover from the practitioner an amount equal to the review fee;

(*b*) is ninety per cent. or more of the amount claimed, and exceeds the amount previously determined under subsection (8), the practitioner may, if the application for review was made by him, recover from the patient an amount equal to the review fee.

'(16) Pending the result of an application for a determination under sub-section (5) or the review of a determination under sub-section (12), no proceedings shall be instituted by a practitioner for the recovery from a patient of any amount involved in such application.

'(17) Where the amount which should have been claimed by a practitioner in respect of any professional services rendered by him has been determined under this section, that practitioner shall not be entitled to recover from the patient concerned in respect of these services an amount exceeding the amount determined.

'(18) This section shall not be deemed to divest the council of any of its powers or functions under Chapter IV in relation to acts or omissions of which it may take cognizance.'

WORLD MEDICAL ASSOCIATION

AID TO EARTHQUAKE VICTIMS

The Secretary General of the World Medical Association announced that Dr. Ernst Fromm, Treasurer of the Association, transmitted a cheque for $1,000.- to the Secretary of the Colegio Médico de Chile to be used to provide medical assistance and relief to the earthquake victims in Chile. Medical associations and doctors of the world are urged to provide medical supplies and funds for the relief of these victims. Assistance should be addressed to: Dr. Rolando Castanon, Colegio Médico de Chile, Miraflores No. 464, Santiago, Chile.

MEDICAL CONFERENCE IN PAKISTAN

The Pakistan Medical Association cordially invites representatives from the medical associations of the world to attend the Sixth Pakistan Medical Conference, Karachi, Pakistan, 25 - 28 November 1960. Additional information with respect to this conference may be obtained from: Dr. H. R. Kahn, Secretary General, Pakistan Medical Association, Garden Road, Karachi.

PASSING EVENTS : IN DIE VERBYGAAN

Edenvale Hospital, Johannesburg. The next clinical meeting will be held on Wednesday 29 June at 8.15 p.m. Three films will be shown (*a*) 'Hospital sepsis' with an explanatory talk by Prof. J. F. Murray, (*b*) 'Margin of error'. and (*c*) 'Operative shock'. All who are interested are invited to attend this meeting.

* * *

South African Institute for Medical Research, Johannesburg. Staff Scientific Meeting. The next meeting will be held on Monday 27 June at 5.10 p.m. in the Institute Lecture Theatre. Dr. J. S. Harrington will speak on 'Studies on silica shock in experimental animals'.

* * *

National Conference on Education, Durban, 9 - 20 July 1960. The theme of this Conference is 'Education and our expanding horizons'. It will form part of the Golden Jubilee celebrations of the University of Natal, Durban. Apart from the 60 South Africans who will speak at the Conference, a number of overseas celebrities will also take part in the Conference. They include Dr. C. W. de Kiewiet, Ph.D., LL.D., Sir Vivian Fuchs, M.A., Ph.D., Sir Edmund Hillary, Sir Julian Huxley, and Col. Laurens van der Post. Correspondence in connection with membership of, and accommodation at, the Conference should be addressed to the Organizing Secretary, National Education Conference, P.O. Box 375, Pietermaritzburg.

* * *

Dr. G. B. Lapinsky, M.B., B.Ch. (Rand), F.C.P. (S.A.), specialist physician, has commenced practice at Medical Centre, 17 West Burger Street, Bloemfontein. Telephones: Rooms 3477, residence 3512.

Dr. G. B. Lapinsky, M.B., B.Ch. (Rand), L.K.I. (S.A.), spesialis-internis, het begin praktiseer te Mediese Sentrum, Wesburger-straat 17, Bloemfontein. Telefone: Spreekkamer 3477, woning 3512.

* * *

Groot Drakenstein Division (M.A.S.A.). A meeting of this Division will be held on 24 June at 7.30 p.m. at the Da Gama Hotel, Strand, Cape. Dr. James Marshall, Head of the Department of Dermatology, Karl Bremer Hospital, Bellville, Cape, will speak on 'Common dermatological conditions in practice'.

* * *

Dr. and Mrs. W. H. Lawrance, left Pretoria on 30 April for a 4 months' visit to England and the Continent. Dr. Lawrance is a member of the Federal Council of the Medical Association of South Africa.

* * *

Prof. O. V. S. Kok, Professor van Anestesiologie aan die Universiteit van Pretoria, het op 10 Junie na Amerika vertrek. Die Wêreldgesondheidsorganisasie se Narkosebeurs vir 1960 is aan hom toegeken en hy sal 6 maande in die buiteland deurbring. Professor Kok sal die V.S.A. asook Engeland en Europa besoek.

* * *

'n Opknappingskursus vir distriksgeneeshere word in die Mediese Skool, Universiteit van Pretoria, gehou van 20 tot 24 Junie 1960.

* * *

Mr. J. G. A. du Toit, F.R.C.S., left Pretoria during April on a study tour of the USA and Japan. Mr. du Toit is a member of the Federal Council of the Medical Association of South Africa.

* * *

College of General Practitioners, Cape of Good Hope Faculty, P.O. Box 643, Cape Town, telephone 3-2022. The Upjohn Travelling Lectures to Mossel Bay, Cape, will take place on Saturday afternoon 2 July and Sunday morning 3 July. Three specialists will be lecturing to doctors in the Mossel Bay district. For further information contact Dr. N. Shear, c/o Health Centre, Mossel Bay, or the Secretary of the College of General Practitioners at the above address.

PROPOSED BRITISH ASSOCIATION FOR CANCER RESEARCH

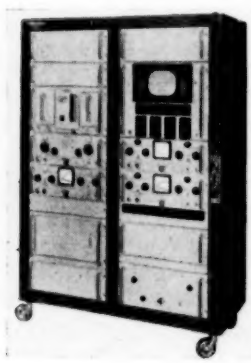
It is proposed to form a British Association for Cancer Research in order to facilitate the interchange of ideas in this field. With the approval of the British National Cancer Committee, arrangements have been made to hold a meeting at the University of Glasgow from 15 to 17 September 1960. This meeting will be open to all workers actively engaged in cancer research in Great Britain, Ireland and the Commonwealth, and it is hoped that there will be a representative attendance.

Application forms for membership of the proposed Association and for registration to attend the Inaugural Meeting can be obtained from the Secretary, Dr. J. G. Bennette, Courtauld Institute, Middlesex Hospital, London, W.1. The registration fee for the meeting is 10s.

NEW PREPARATIONS AND APPLIANCES : NUWE PREPARATE EN TOESTELLE

TELCO

Westdene Products (Edms.) Bpk. kondig aan dat hulle aangestel is as die enigste invoerders en verspreiders vir Telco Electronique Medicale et Industrielle, Parys, Frankryk, vervaardigers van elektroniese kardiovaskulêre diagnostiese en opmetings-uitrusting.



In hulle vertoonkamers te Essanby Huis 23, Jeppestraat 175, Johannesburg, word 'n eenheid vertoon wat in 'n rak ingebou is en wat uit die volgende instrumente bestaan:

1. 'n EKG-versterker wat 100% elektronies gereguleer word.
2. 'n Ossiloskoop met 'n naligtingskerm van 7 duim. Dit het 4 verhelderde skale. Spoed ½ duim, 1 duim, en 2 duim per sekonde.
3. 'n Fotografiese registreerder met 4 kanale. Die registreerder maak outomatiese merke van tyd- en ordinaat-lyne. Galvonometers van 100 - 700 aps. Dit gebruik 120 mm.-papier.
4. 'n M41 R elektrodrukmeter met 'n RA 8 kop vir transduksie vir die studie van bloeddruk deur kateterisasie.
5. 'n MM41 R mikrodrukmeter met 'n transduksie-apparaat wat aan die punt van 'n nr. 8F U.S.C.I. hartkateter vas is. 'n Drukmeter word gebruik vir die gelyktydige registrasie van druk en hartklanke. Die kateter het ook 'n tweede holte om monsters bloed te neem. Dit het geen artifak en geen vloeistof-kolom nie.
6. 'n CE4 4-kanaal elektroniese skakelaar.

Die eenheid meet: (*a*) bloeddruk deur sy standaard transduksie-apparaat; (*b*) bloeddruk deur sy mikrotransduksie-apparaat; (*c*) intrakardiale geluide deur sy mikrotransduksie-apparaat; en (*d*) die EKG.

Die 4 tekens word vertoon op die 7-duim ossiloskoop-skerm en geregistreer op 'n fotografiese registreerder.

Verdere informasie aangaande Telco elektroniese uitrusting of aanbevelings vir apparaat wat op besondere gebiede van die medisyne of die chirurgie gebruik word, is verkrygbaar van Westdene Products (Edms.) Bpk., Posbus 7710, Johannesburg, of telefoon 23-0314.

NEO-NACLEX

Glaxo Laboratories (S.A.) (Pty.) Ltd. introduce Neo-Naclex Tablets, a 'one-dose-daily' diuretic, and supply the following information:

Neo-Naclex is an oral diuretic (bendrofluazide) sufficiently potent and long lasting to give effective treatment with a single dose daily.

In practice one 5-mg. Neo-Naclex tablet daily could replace, for example, a twice-daily dosage of 50 mg. hydrochlorothiazide or two 500 mg. chlorothiazide tablets daily. One dose of Neo-Naclex produces diuresis lasting up to 18 hours, yet it is relatively free from significant side-effects and has minimum likelihood of causing potassium loss.

Neo-Naclex can be used for every diuretic purpose. Treatment can start with one 5 mg. tablet taken daily at breakfast. Intervals of 3 days may be left between each week of treatment. For maintenance one 2·5 mg. tablet can be given daily with intervals between doses, lengthening until even one dose weekly may suffice. Dosage, of course, should be varied to suit the individual.

The once-daily dosage of Neo-Naclex gives effective diuresis at a considerable reduction of cost.

Supply	2·5 *mg.*	5 *mg.*
Bottles of 25 ..	6s. 8d. each.	12s. 9d. each.
Bottles of 100 ..	24s. 3d. each.	45s. 6d. each
Bottles of 500 ..	116s. 0d. each.	204s. 3d. each.

DIDROTHENAT

Noristan Laboratories announce the introduction of Didrothenat a detoxicated dihydrostreptomycin preparation, and supply the following information:

Didrothenat is a mixture of dihydrostreptomycin sulphate (80%) and dihydrostreptomycin pantothenate (20%). The preparation has been developed in the research laboratories of Messrs. Chemie Gruenenthal GmbH. Stolberg/Rhineland in an effort to eliminate the toxic after-effects of streptomycin and dihydrostreptomycin which have so far sharply restricted the therapeutic use of these substances.

Extensive animal experiments followed by clinical trials over years have proved this combination to be therapeutically fully effective and yet practically free from neurotoxic effects. The detoxication is ascribed to the new pantothenic acid compound, the so-called pantothenate of dihydrostreptomycin, which prevents occurrence of irreparable deafness even after prolonged treatment. It has been conclusively reported by clinical investigators that a content of 20% of dihydrostreptomycin pantothenate, mixed with 80% dihydrostreptomycin sulphate, is sufficient to provide full protection and that Didrothenat is safe to use.

Didrothenat is available in vials, containing the equivalent of 1 g. dihydrostreptomycin (base).

Information and literature can be obtained from the sole South African distributors, Messrs. Noristan Laboratories (Pty.) Ltd., P.O. Box 78, Silverton, Transvaal.

BOOK REVIEWS : BOEKBESPREKINGS

YEAR BOOK OF RADIOLOGY

The Year Book of Radiology, 1958-1959. Radiologic Diagnosis. Edited by John Floyd Holt, M.D. and Fred Jenner Hodges, M.D. *Radiation Therapy.* Edited by Harold W. Jacox, M.D. and Morton M. Kligerman, M.D. Pp. 448. 336 figures. $10.50. Chicago: The Year Book Publishers, Inc. 1959.

This year, as in previous years, good abstracts from a varied selection of articles by recognized experts in all sections of radiotherapy, are reported.

However, as in the diagnostic section, most of the articles come from the radiological journals and it seems a great pity that many excellent and authoritative articles in the general medical journals are not included.

Supervoltage irradiation is now becoming a standard procedure in most centres all around the world, and enough time has elapsed for 5- and 10-year results to be evaluated. These show no dramatic improvement in end results, but techniques are simplified and the various resultant reactions have been markedly reduced by the use of this modality. Kaplan, of Stanford University, in an excellent article discusses the deficiencies of American radiotherapy as compared to that of Britain and the Scandinavian countries and makes a strong plea for the complete separation of the two specialties which, he says, are bound together only by a common physical agent and nothing else.

This volume contains a stimulating and interesting résumé of all sections of radiotherapy and, although much has been achieved in all branches of the specialty, none of the contributors shirk to mention the difficulties which remain. I.M.S.

ACCIDENT SURGERY

Modern Trends in Accident Surgery and Medicine. Edited by Ruscoe Clarke, *M.B.E.*, M.B., F.R.C.S. (Eng.); F. G. Badger, B.Sc., F.R.C.S. (Ed.) and Simon Sevitt, M.D., M.Sc., F.R.C.P.I., D.P.H. Pp. xi + 330 + 16. 82 figures. £4 4s. 6d. plus 2s. 0d. postage. London: Butterworth & Co. (Publishers) Ltd. South African Office: Butterworth & Co. (Africa) Ltd., P.O. Box 792, Durban. 1959.

This is an important book. It is, in effect, a report of the working arrangements of the Birmingham Accident Hospital which, founded in 1941, is now treating 50,000 new patients per year.

The book bristles with sensible advice and plain statements which could well be applied to all hospitals. Antiseptics, plain or coloured, never give as good results as mechanical cleansing with good plain soap and plenty of warm water, and this is recommended for the primary fresh wound. For the next stage, le Riche's famous dictum: 'The best antiseptic is the knife', is quoted but débridement must be carried out with intelligence and forbearance! How self-evident too is the truth of the statement, 'Taking a limb apart for information is not justifiable' and how often is this forgotten in the heat of operating!

Of the traumatic surgeon himself, the authors say in a telling phrase: 'It is the man, his interests, training and experience and not the terminology that matters'.

The cost of this accident service is without doubt very considerable, but the authors put the matter into its proper perspective: 'The cost per incident is not the basis of the fire-brigade or life-boat services'.

A vital book; never more necessary to read than today.

T.S.

DEVELOPMENT OF PRE-SCHOOL CHILDREN

Developmental Potential of Preschool Children. An Evaluation of Intellectual, Sensory and Emotional Functioning. By Else Haeussermann. Pp. xvii + 285. 19 figures. $8.75. New York and London: Grune & Stratton, Inc. 1958.

A test of intellectual function allows the examiner to assess the child's current level of functioning, and also to predict how the child will respond to future educative influences. The standard tests in use cannot be applied to children with neurological lesions, or children with disturbances of perception.

Miss Haeussermann's test, devised during 25 years of work with brain-damaged and retarded children, is a clinical procedure in the form of a structured interview, providing a profile of the functional abilities and probable developmental potential of the child. The test was worked out and validated on children with cerebral palsy, but has been extended to other types of handicapped children.

The 'educational evaluation' obtained by the test procedure consists of an inventory of developmental levels, physical functioning, sensory equipment, language behaviour, etc., and appears an effective tool in the behavioural examination of young disabled children. H.W.

BASIC PHYSICS IN RADIOLOGY

Basic Physics in Radiology. By L. A. W. Kemp, B.Sc., Ph.D., F.Inst.P. and R. Oliver, M.Sc., F.Inst.P., A.M.I.E.E. Pp. xiii + 329. Illustrations. 35s. Oxford: Blackwell Scientific Publications. 1959.

The authors are to be congratulated on producing a text-book of considerable merit designed to present in a logical and lucid manner physics fundamental to an understanding of certain aspects of radiology.

The text is amply supplemented by diagrams, graphs and tables and is enhanced by illustrative examples and exercises constructed to elucidate the various facets of the subject as they present themselves. Six appendices are added, ostensibly to complete and extend the text.

Difficulty has obviously been encountered in deciding what to include or exclude. The volume suffers considerably in the virtual absence of radiation physics.

It forms, however, an appropriate companion to *A Student's Radiological Mathematics.* Both are admirably written. It is to be hoped that the authors will produce at least a further volume covering radiation physics and so add materially to the attractiveness of this fine work. J.M.G.

ORTHOPAEDICS AND FRACTURES

A System of Orthopaedics and Fractures. By A. Graham Apley, M.B., B.S., F.R.C.S. Pp. vii + 357 + (20). There are two editions of this book available, namely a standard edition, the price of which is 54s. 3d. + 1s. 9d. postage. The other edition is interleaved with blank pages for those who wish to add their own notes. The price of this is 75s. 9d. + 1s. 9d. postage. London: Butterworth & Co. (Publishers) Ltd. South African office: Butterworth & Co. (Africa) Ltd., P.O. Box 792, Durban. 1959.

This first edition is a very lucid and instructive handbook on the common conditions encountered in orthopaedic work by medical practitioners. It is the outcome of years of teaching and embodies rewritten and amplified notes as given to F.R.C.S. students through the years. The author puts his information down in clear and concise manner.

The emphasis constantly falls not so much on the perfection of factual knowledge as on the methodical approach which the author has adopted. Thus the first chapter appropriately discusses 'diagnosis in orthopaedics' fairly exhaustively from the practical angle and this is aptly followed up with a chapter on 'inflammation of bone and joint'. In this connection one wonders whether nowadays it still is necessary to use the terms 'periostitis'

and 'osteomyelitis' which surely are fully covered by the term 'osteitis'. Inflammation in bone always in some degree affects all parts of the bone.

Dealing as it does with fractures and orthopaedics, this book should prove useful to all who handle cases of this nature as well as to final-year medical students interested in this direction. The text is interleaved with blank pages for note taking when necessary. G.C.A.v.d.W.

SURGERY FOR NURSES

Modern Surgery for Nurses. 4th edition. Edited by F. Wilson Harlow, M.B., B.S. (Durham), F.R.C.S. (Eng.). Pp. xxiv + 883. 419 figures. 30s. net. London: William Heinemann Medical Books Ltd. 1959.

This excellent text-book for nurses first made its appearance in 1948. Its popularity is obvious in the fact that it is now in its 4th edition and has had 4 reprintings. One can well understand why it should have found such favour, for it is simple, clear and concise, well printed and produced, and profusely illustrated. It is in fact more than a text-book, for not only does it cover the normal syllabus for the surgical nurse but it also is a useful reference book for the trained nurse. Sister-tutors will find it of great value. A.H.T.

HERNIA

Hernia. By Sir Heneage Ogilvie, *K.B.E.*, M.A., M.Ch., M.D., F.R.C.S. Pp. 135. 51 figures. 28s. London: Edward Arnold (Publishers) Ltd. 1959.

Anatomical knowledge and surgical skill are acquired in the operating theatre and the mastery of hernia surgery depends to a large extent on the apprenticeship served. Nevertheless, all too frequently the pupil slavishly follows in the footsteps of his master and either forgets or is unaware of the techniques practised by others. It is in counteracting this tendency that much of the value of such books as this lies.

Sir Heneage succeeds admirably in condensing his wealth of personal experience into 130 pages and gives reasons for accepting or rejecting the various procedures he has employed over the past 30 years. Many of his dogmatic views will not find general acceptance, but this is to be expected in so controversial a subject. Written in his usual effortless style, illustrated with clear line drawings, of convenient format, it serves as an excellent background for the postgraduate student.

This is not the complete text-book on hernia surgery but it provides much food for thought. All aspirant surgeons who read and digest this stimulating little book will benefit. H.P.

MODERNE BEHANDELING

Modern Treatment Yearbook 1959. Silwer Jubileum-uitgawe. Geredigeer deur Sir Cecil Wakeley Bt., *K.B.E.*, *C.B.*, LL.D., M.Ch., D.Sc., F.R.C.S., F.R.S.E., F.R.S.A., F.A.C.S., F.R.A.C.S. Pp. xix + 312. 2 afbeeldings. xxiii afdrukke. 30s. Londen: Uitgegee vir ‚Medical Press' deur Baillière, Tindall en Cox Bpk. 1959.

Met die deurlees van die boek kom 'n mens onder die indruk dat die samesteller daarin geslaag het om 'n deeglike oorsig te gee, op 'n breë front, van die moderne ontwikkeling op mediese gebied.

Die boek is bedoel vir die algemene praktisyn want dit bied 'n deeglike opknappingskursus, waarin die essensiële benadruk word, sonder om aan oorvereenvoudiging mank te gaan. Ook vir die spesialis is dit nuttig, veral om hom uit sy eng groef te ruk.

'n Mate van kritiek is juis weer dat sake bespreek word wat buite die terrein van die algemene praktyk val. Die heel eerste hoofstuk oor plastiese snykunde van die hand is hiervan 'n voorbeeld. Dit is baie interessant en verduidelik aan die algemene praktisyn wat gedoen kan word, maar is van weinig nut vir hom in sy werk.

Die hoofstukke oor hipertensie, pertussis, tuisbehandeling van kardiale infarksie, behandeling van asma, en bedaarmiddels, ens., is nie alleen verfrissend insiggewend nie, maar gee praktiese wenke wat met goeie gevolg toegepas kan word.

As geheel is die Silwer Jubileum-uitgawe 'n waardige hoogtepunt vir die uitgewers en kan die boek sterk aanbeveel word by alle praktisyns. I.S.S.

MENSTRUAL DISORDERS AND STERILITY

Mazer and Israel's Diagnosis and Treatment of Menstrual Disorders and Sterility. 4th edition. By S. L. Israel, M.D. Pp. xii + 666. Illustrations. $15.00. New York: Paul B. Hoeber, Inc. 1959.

This publication is divided into two sections, each of which is so different that it could well have been published as a separate book. The first section, which comprises two-thirds of the volume, deals with menstrual disorders, and the second with sterility. This is the 4th edition of a well-known American text-book, and appears 8 years after its predecessor. It very successfully incorporates advances made in the subject during this time.

The work differs from most text-books of gynaecology in that every type of menstrual disorder is considered as a clinical entity. The discussion of their hormonal aspects is indeed the outstanding feature of the book, and could hardly be bettered.

The section on sterility is comprehensive. Chapters are included which deal with the male factor, artificial insemination, and recurrent abortion. Few gynaecologists have had as great an experience as the authors in the use of low-dosage irradiation in the treatment of amenorrhoea—their views on this topical problem are well worth studying.

There are few statements that are controversial, or that are not supported by abundant references to the literature. This book could be read with much profit by postgraduate students and specialists. However, although the presentation is essentially a clinical one, the work is hardly a practical one for the busy general practitioner. F.B.

CORRESPONDENCE : BRIEWERUBRIEK

INTERNATIONAL SOCIETY FOR THE WELFARE OF CRIPPLES

To the Editor: I have been asked to furnish you with information about South African representation at the 8th World Congress of the International Society for the Welfare of Cripples, being held in New York from 28 August to 2 September 1960.

The official representatives of the National Council for the Care of Cripples in South Africa will be:

Dr. Emilia Krause, who will serve as co-Chairman of the First General Session of the Congress. Dr. Krause is a Vice-Chairman of the National Council for the Care of Cripples in South Africa, and Chairman of the OFS Society in Aid of Crippled Children. She represents South Africa on the Assembly of the International Society for the Welfare of Cripples and is a member of the World Council of that body.

Mr. J. C. Merkin, who will serve as Chairman of a panel dealing with presentations from a number of countries. Mr. Merkin is a Vice-Chairman of the National Council for the Care of Cripples, Chairman of the Cripples' Care Association of the Transvaal and also represents South Africa on the Assembly of the International Society for the Welfare of Cripples.

Dr. Ben Epstein, who will be one of the principal speakers at the special scientific session on cerebral palsy. He will present a paper on 'The early diagnosis of cerebral palsy'. Dr. Epstein will also participate in the final session of Congress as a speaker from South Africa. Dr. Epstein is Chairman of the Board of Management of the Pretoria Cerebral Palsy School, Vice-Chairman of the Cerebral Palsy Division of the National Council for the Care of Cripples and a member of the World Commission on Cerebral Palsy. Dr. Epstein is consulting paediatrician to the Edenvale Provincial Hospital.

Other members of the National Council who will be attending the Congress are: Dr. Cecil Morris, of Johannesburg, who is an orthopaedic surgeon: Dr. A. L. Lomey, Head of the Department of Physical Medicine, Johannesburg General Hospital; and Miss S. Oosthuizen, M.C.S.P., Superintendent of the Avalon Institution.

H. J. C. Parker
National Secretary

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